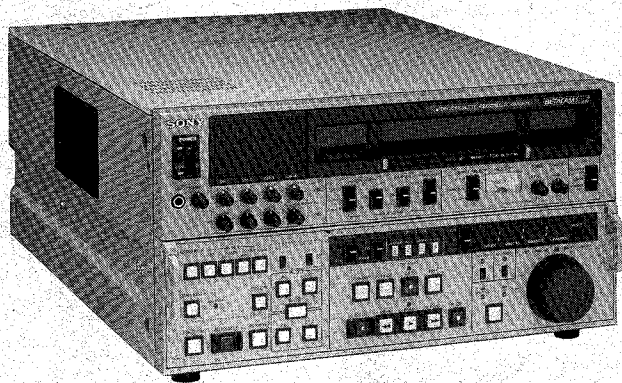


SONY

VIDEOCASSETTE RECORDER

BVW-70



BETACAM SP™

OPERATION MANUAL
1st Edition (Revised 2)
Serial No. 10001 and Higher

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC rules.

WARNING: Using this unit at a voltage other than 120 V may require the use of a different line cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel.

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OVERVIEW

The BVW-70 is a video cassette tape recorder designed to record and playback video and audio signals in the "Betacam SP" (Superior Performance) format to enhance the video and audio quality and to achieve longer recording and playback time. Electronic editing is possible using two BVW-70s or using a BVW-70 and another VTR, such as a "Betacam SP" VTR, a conventional Betacam VTR, U-matic VTR, 1-inch helical scan VTR, or digital cassette VTR*.

Betacam SP format

High quality pictures using metal particle tape

Thanks to the usage of metal particle tape and the newly developed video head, "Betacam SP" offers a much higher video quality, compared to the original "Betacam" format, by improving signal-to-noise ratio, frequency response, linear waveform distortion and detail reproduction characteristics.

Owing to this improvements, the video quality is highly enhanced and is maintained even after multiple dubbings. The high durability of the metal particle tape meets professional standards, especially for the broadcasting of commercials.

4 Audio channels

In addition to the two conventional channels of longitudinal (LNG) audio, two channels of frequency modulated audio (AFM) are recorded on the chrominance track (only when metal particle tape is used.)

The wide dynamic range of the AFM audio (85 dB) enables the unit to handle any unexpected surge of the recording signal level. The metal particle tape also gives the LNG audio excellent frequency response and low distortion.

Longer recording and playing time

The "Betacam SP" format allows a maximum of 90 minutes for recording and playback by utilizing a large cassette. In addition, the small (conventional) size cassette tape (maximum 30-minute) can be used.

Compatibility with conventional "Betacam" VTRs

Small (conventional) size oxide or metal particle tape recorded on this unit can be played back on a conventional "Betacam" VTR, and tapes recorded on a conventional "Betacam" VTR can be played back on this unit.

* Equipment to be used

"Betacam SP" VTR: BVW-35, BVW-60, BVW-65, BVW-75

"Betacam" VTR: BVW-10, BVW-15, BVW-25, BVW-40

U-matic VTR: BVU-800, BVU-820, BVU-950

1-inch helical scan VTR: BVH-2000 series VTR,

BVH-3000, 3100

Digital cassette VTR: DVR-1000/DVPC-1000

Multiple editing functions

Editing functions

Manual or automatic editing in the assemble or insert mode can be performed by using two BVW-70s. The various functions such as entering, trimming or deleting the edit points and previewing, reviewing, etc. facilitate editing.

Quick access to the editing points

Search functions providing a recognizable picture in the SHUTTLE mode (0 to ± 24 times normal speed) and the JOG mode (0 to ± 1 time normal speed) makes it possible to search for the edit points quickly. Pictures in color can be monitored at the speed from 0 to ± 5 times normal speed.

Split editing

When the INSERT mode is selected, audio and video edit points can be set separately.

Duration indication

The duration between any two points among IN, OUT, audio IN and OUT points can be indicated.

Digital time counter

The LTC/VITC time code or the time data determined by counting the CTL signal is displayed on the time counter display, which facilitates setting of the edit point precisely. User bit indication is also possible.

SCH indicator

The SCH INPUT/OUTPUT indicator indicates whether the SC-H of the input/output signal conforms to the RS-170A standard.

Simultaneous playback by confidence heads

Simultaneous playback of video and audio 1 and 2 channels by the confidence heads is possible to confirm recording.

Capstan override mode

The playback speed can be varied within $\pm 16\%$ of normal speed to synchronize the unit to another VTR.

Limiter circuit, mixer, independent level adjustment for audio recording and playback

For audio channels 1 and 2, the limiter circuit minimizes the distortion caused by excessive audio input signal level. The built-in audio mixer can be used to record the mixed signal of the two channels.

The recording and playback levels of the four audio channels can be adjusted independently.

Audio noise reduction system


The noise reduction system of Dolby C type NR* is used for the channels 1 and 2 (LNG audio), and the "Betacam" noise reduction system is used for channels 3 and 4 (AFM audio).

Built-in time base corrector

The built-in time base corrector offers a stable playback picture.

Built-in time code generator/reader

The built-in time code generator/reader permits recording of time code (LTC and VITC**) and user bit simultaneously with the audio and video signals. The recorded time code or user bit is read by the reader during playback.

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

** LTC (longitudinal time code): Time code recorded on the longitudinal time code track
VITC (vertical interval time code): Time code recorded on the video track in the vertical interval of video signal

Multiple input/output connectors

Remote control connectors

Three remote control connectors, REMOTE-1 IN/OUT (9-pin) which conform to the RS-422A format and REMOTE-2 (36-pin) connectors, are equipped to enable remote control of this unit from an external remote controller or from the recorder, or for parallel operation of two or more VTRs.

Dubbing connector

The DUB/COMPONENT 1 and COMPONENT 2 connectors make possible high quality video signal editing or dubbing between this unit and another "Betacam SP" or "Betacam" format VTR or DVR-1000/DVPC-1000 digital cassette VTR.

Superimpose signal output

VIDEO OUTPUT-3 connector and MONITOR connector supply the information of time data, tape speed and settings in the SET UP menus to be superimposed on the picture monitors.

Maintenance

Self-diagnostics

If the unit cannot be operated normally owing to a certain error, the self-diagnostics function detects the cause and indicates the corresponding error code number on the time counter display.

Digital hours meter

The accumulated time while the unit is turned on, the drum is rotating, or tape is running and the total times of tape threading/unthreading are indicated on the digital hours meter.

Easy access to boards

The built-in boards are plug-in type which is easy to access for service and maintenance.

For easy and convenient operation

Set up by using menus

Settings such as for the interface with the connected units or VTR operating conditions can be easily made by using the SET UP menus on the front panel.

Computer servo system

The CPU controls the four direct drive DC servo motors in the drum, capstan and two reels to enable quick and accurate tape access.

Remote control

The optional control panel BVR-75 can be connected with an extension cable.

Front access

Cassette insertion and other operations can be performed on the control panel. The lower panel can be tilted up to 90 degrees for the operator's convenience.

Mountable in a standard 19-inch rack

The BVW-70 can be mounted in an EIA standard 19-inch rack with RMM-100 rack mount adaptor (optional). For rack mounting, refer to the maintenance manual.

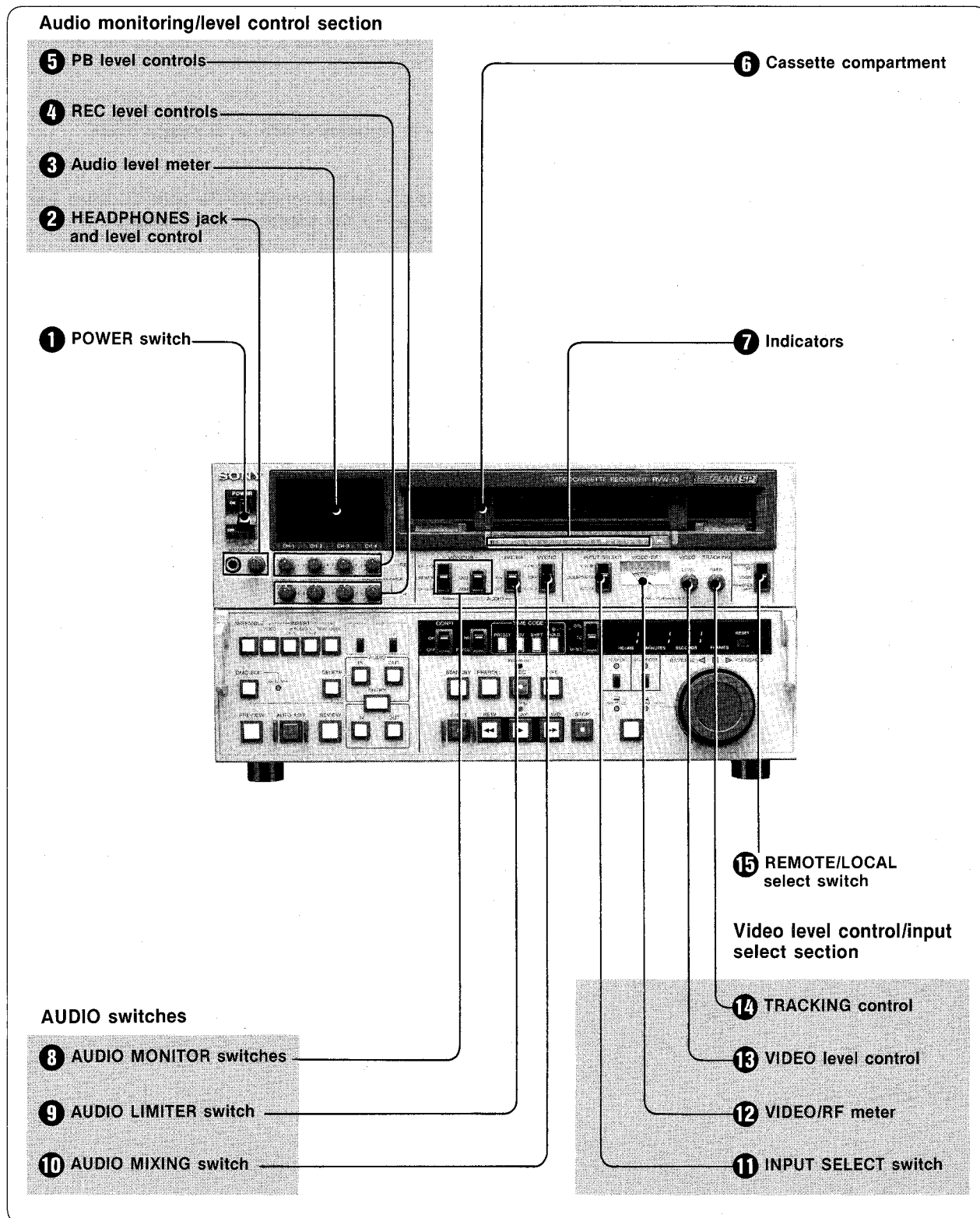
Portability and low power consumption

The compact and lightweight BVW-70 is suitable for use in various situations, such as in studios, in OB vans, and for EFP (Electronic Field Production).

LOCATION AND FUNCTION OF PARTS AND CONTROLS

Control Panel

Upper control panel



1 POWER switch

Set the switch to ON to turn on the power. The audio level meter, VIDEO/RF meter and the time counter display will light up.

2 HEADPHONES jack and level control

Connect 8-ohm stereo headphones. The audio signal selected with the AUDIO MONITOR switches can be monitored.

With the level control, adjust the level of the signal output from the HEADPHONES jack and AUDIO SELECTED OUTPUT CH-1/CH-3 and CH-2/CH-4 connectors.

- When the item number 103 in SET UP menu 2 is set to AUTO, the level of the signal output from the SELECTED OUTPUT connectors cannot be adjusted. For SET UP menu 2, refer to the maintenance manual.

3 Audio level meter (VU/peak meter)

Indicates the recording level in the REC or E-to-E mode, and the playback level in the PLAY mode or CONF mode.

- The meter is factory preset to the VU meter. To change the meter to the peak meter, refer to the maintenance manual.

4 REC level controls

To adjust the recording level of each channel: Pull out each control and adjust while monitoring the audio level meter in the E-to-E mode.

To set the level to the preset level: Set the control to the pushed-in position.

(Preset level is, at +4 dBm input, 0VU on the VU meter and -9 dB on the peak meter.)

5 PB level controls

To adjust the output level of each channel: Pull out each control and adjust while monitoring the audio level meter in the PLAY mode.

To set the level to the preset level: Set the control to the pushed-in position.

- To change the preset level of the REC level or PB level, refer to the maintenance manual.

6 Cassette compartment

Insert a cassette. For inserting a small size cassette, align the cassette with the marks on the compartment window.

7 Indicators

SCH indicators

SCH INPUT or OUTPUT indicator lights up when the sub-carrier phase in the input or output signal conforms to the RS-170A signal standard.

AUTO OFF indicator

Lights when moisture condensation is detected on the head drum. When the moisture condensation is removed, the indicator goes off.

VITC indicator

PLAY mode: Lights up when VITC is found on the tape played back.

REC/E-to-E mode: Lights up when VITC is inserted in the input video signal.

LTC indicator

PLAY mode: Lights up when LTC is found on the tape.

REC/E-to-E mode: Lights up when LTC is recorded. When the external time code is selected and there is no external LTC input, the indicator does not light.

DOLBY NR indicator

Lights up when the DOLBY NR circuit is activated.

8 AUDIO MONITOR switches

Select the signal output from the HEADPHONES jack, MONITOR connector and SELECTED connectors.

(A) When item number 103 in SET UP menu 2 is set to MANUAL (factory preset condition)

Connectors		HEADPHONES	MONITOR	SELECTED
MONITOR switches				
CH-1/3	LNG	CH-1	CH-1	CH-1
	AFM	CH-3	CH-3	CH-3
ST/MIX	LNG	CH-1/2 (Stereophonic)	CH-1/2 (Mixed)	CH-1/2 (Stereophonic *)
	AFM	CH-3/4 (Stereophonic)	CH-3/4 (Mixed)	CH-3/4 (Stereophonic *)
CH-2/4	LNG	CH-2	CH-2	CH-2
	AFM	CH-4	CH-4	CH-4

Notes

- When oxide tape is used, no signal is output when the MONITOR switch is set to AFM.
- The level of the signal output from the SELECTED connectors is adjusted with the HEADPHONES level control.

(B) When item number 103 in SET UP menu 2 is set to AUTO

LNG audio or AFM audio is automatically selected depending on the tape regardless of the MONITOR switches setting.

Connectors		HEADPHONES	MONITOR	SELECTED
Tape				
Oxide tape		CH-1/2 (Stereophonic)	CH-1/2 (Mixed)	CH-1/2 (Stereophonic)
Metal particle tape		CH-3/4 (Stereophonic)	CH-3/4 (Mixed)	CH-3/4 (Stereophonic)

Note

The level of the signals output from the SELECTED connectors is fixed to the preset level.

9 AUDIO LIMITER switch

After adjusting the recording level, set this switch to ON to activate the limiter circuit. The limiter circuit limits sudden surges of input signals for CH-1/2 (LNG audio) to a fixed level during recording to minimize distortion.

*This signal becomes a mixed signal by setting the AUDIO MONITOR switch on the sub-control panel to MONO.

⑩ AUDIO MIXING switch

Select the audio channel on which the mixed audio signals of channels 1 and 2 are to be recorded.

To CH-1: The mixed signal is recorded on channel 1. On channel 2, the audio signal of channel 2 only is recorded.

OFF: The audio signals of channel 1 and channel 2 are recorded on channels 1 and 2 respectively.

To CH-2: The mixed signal is recorded on channel 2. On channel 1, the audio signal of channel 1 only is recorded.

⑪ INPUT SELECT switch

Set the switch to the appropriate position according to the input video signal for recording or editing.

Setting	Signal	Input connector
Y-R,B	Component (Y/R-Y/B-Y) signal	DUB/COMPONENT 1 or COMPONENT 2 (Select with the COMPONENT 1/2 select switch at the rear.)
COMPOSITE	Composite video signal	VIDEO INPUT
CTDM	CTDM (Compressed Time Division Multiplex) signal	DUB/COMPONENT 1

⑫ VIDEO/RF meter

The meter indicates the video signal recording level in the REC or E-to-E mode.

In the PLAY mode, tracking (playback FM signal level) can be checked with the meter.

⑬ VIDEO level control

When the INPUT SELECT switch is set to COMPOSITE, adjust the video recording level. To adjust the level, pull out the control and turn it so that the pointer of the VIDEO/RF meter points in the blue zone. To set the level to the reference level, set the control to the pushed-in position.

⑭ TRACKING control

During recording, and normally during playback, set the control to the center FIXED position.

When noise appears in the playback picture, adjust the tracking with the control so that the pointer of the VIDEO/RF meter indicates the maximum RF level.

- The DT head traces the center of the track regardless of the position of the control.

⑮ REMOTE/LOCAL select switch

Set the switch to REMOTE 1 or 2 to remotely control this unit from the unit connected to the REMOTE connectors.

REMOTE 1: The unit can be controlled by the unit connected to the REMOTE 1-IN (9-pin) connector.

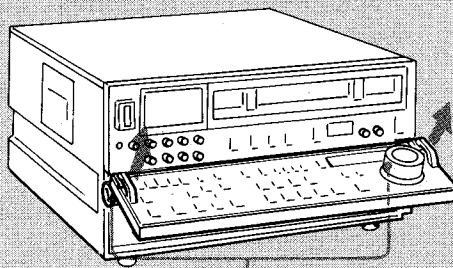
LOCAL: This unit cannot be remotely controlled. Set the switch to LOCAL to use the unit alone or as the recorder VTR in recorder-player editing.

REMOTE 2: This unit can be controlled by the controller connected to the REMOTE 2 (36-pin) connector.

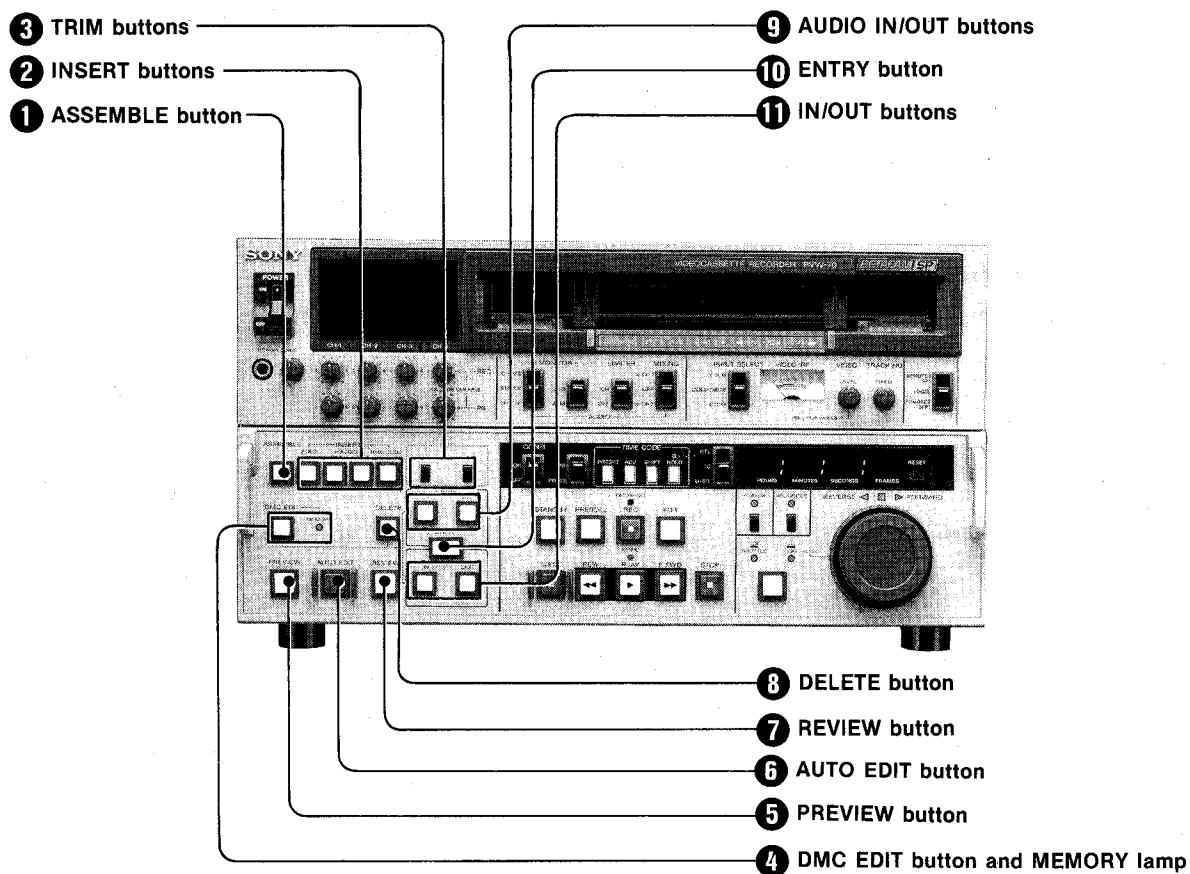
- When the switch is set to REMOTE 1 or 2, the function buttons on the control panel (except the STOP and EJECT buttons) are disabled. To enable buttons other than the STOP and EJECT buttons in the REMOTE mode, or to disable all the buttons, refer to "SET UP".

Lower control panel

The lower control panel can be tilted up to 90 degrees by approximately 15 degree step.



Turn the knobs clockwise to hold the panel firmly.



1 ASSEMBLE button

Press to select the ASSEMBLE edit mode. The button lights. To cancel the mode, press the button again.

2 INSERT buttons

To edit in INSERT mode, select the edit channels by pressing the buttons. The selected channel button lights. To cancel the mode, press the button again.

3 TRIM buttons

Two functions are available.

(A) Trimming the edit points

Press the TRIM + or - button while depressing the IN, OUT, AUDIO IN or AUDIO OUT button to advance or delay the edit point by frame.

(B) Capstan override mode

Keep the TRIM + or - button depressed while depressing the PLAY button.

While the TRIM button is depressed, the tape speed is adjusted to $\pm 8\%$ of the normal speed.

4 DMC EDIT button and MEMORY lamp

Press this button to set the unit in the DMC EDIT mode. In this mode, tape speed of the player controlled by the search dial in the SHUTTLE mode is memorized during editing when the MEMORY lamp is blinking. The tape then runs at the memorized speed when preview or automatic editing is started.

5 PREVIEW button

Press this button to start preview.

When this button is pressed before setting the IN point, the present tape position is automatically entered as the IN point and preview is performed.

6 AUTO EDIT button

Press this button to start automatic editing.

When this button is pressed before setting the IN point, the present tape position is automatically entered as the IN point and editing is performed.

7 REVIEW button

Press this button to review the edited picture and sound.

8 DELETE button

To delete an edit point data, press this button simultaneously with one of the IN, OUT, AUDIO IN and AUDIO OUT buttons. To cancel the DMC EDIT mode, press this button simultaneously with the DMC EDIT button.

- The DELETE button blinks to indicate that the preview or automatic editing cannot be started because the entered edit data conflict with each other, such as the duration is different on the recorder and the player or the OUT point is located before the IN point. Re-enter the edit point correctly so that the DELETE button goes off.

9 AUDIO IN/AUDIO OUT buttons

To enter audio IN or audio OUT point, press this button and the ENTRY button simultaneously.

To display each edit point data on the time counter display, press this button only.

10 ENTRY button

To enter the edit point data, press this button simultaneously with one of the IN, OUT, AUDIO IN and AUDIO OUT buttons.

11 IN/OUT buttons

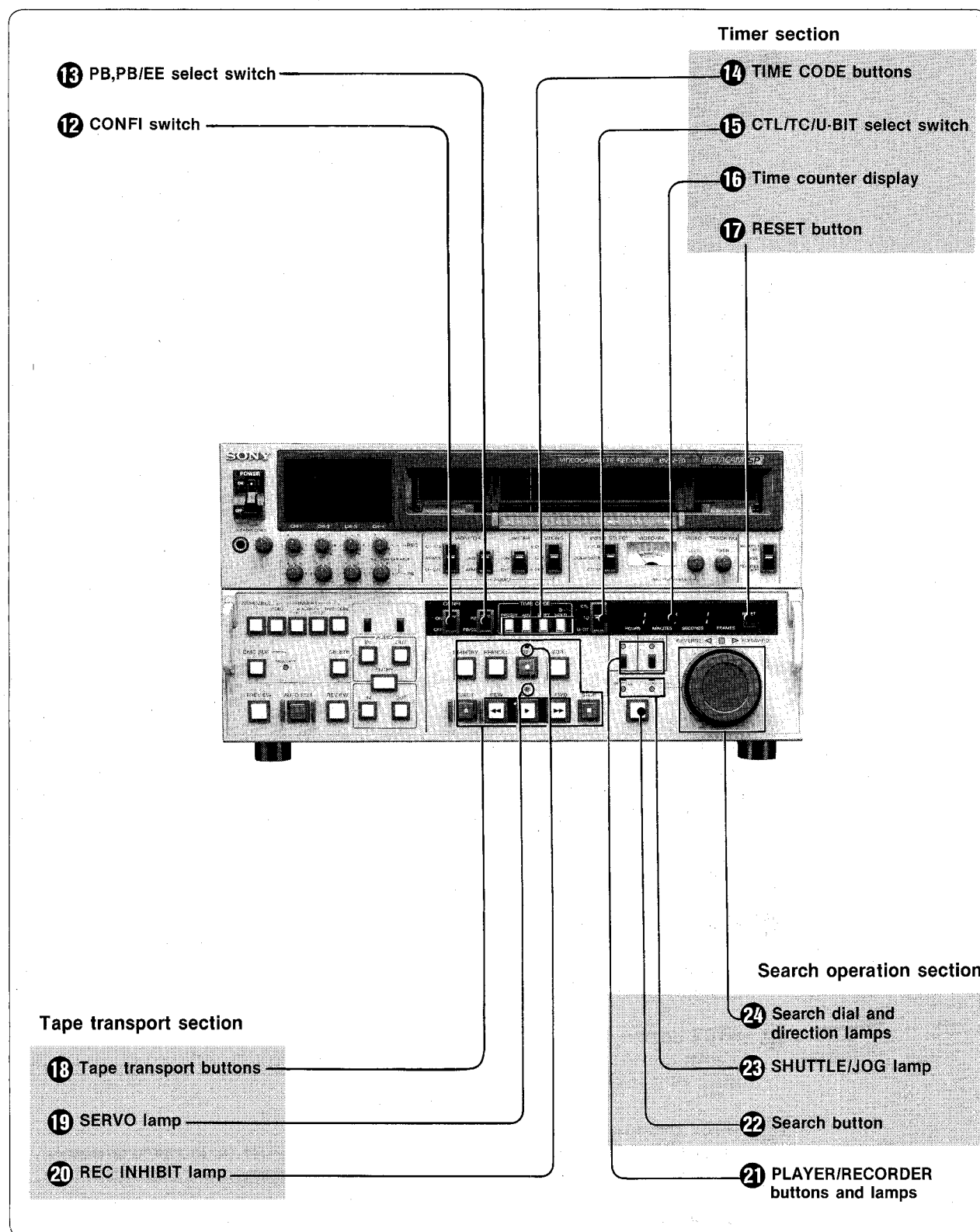
To enter IN or OUT point, press this button and the ENTRY button simultaneously.

To display each edit point data on the time counter display, press this button only.

Lamp indication of the IN, OUT, AUDIO IN and AUDIO OUT buttons

When an edit mode is selected, the IN and OUT buttons will blink to indicate that the points need setting. When the data is entered, the button lights, and when the data is automatically determined by the other data, the button goes off.

Lower panel



12 CONF1 switch

Set the switch to ON to monitor the simultaneous playback picture and sound (CH-1/2) during recording.

13 PB,PB/EE select switch

Set the switch to PB to select the PB signal, and to PB/EE to select the EE signal, for the signal output from the VIDEO and AUDIO OUTPUT connector in the rewind, fast forward, STOP or STANDBY mode.

14 TIME CODE buttons

Use these buttons to set the desired time code or user bit into the built-in time code generator.

HOLD button and lamp

Press this button to hold the time data in the time counter display. The lamp is lit and the leftmost digit starts blinking. To return to the present time, press the button again.

SHIFT button

Changes the blinking number position. Every time the button is pressed, the position is shifted to the right. By keeping the button depressed, the position is shifted continuously. After the position reaches the right end, the leftmost digit starts blinking again.

ADVANCE button

Every time this button is pressed, the blinking number in the time counter display increases by one. By keeping the button depressed, the number increases continuously.

PRESET button

After the desired data is entered in the time counter display, register the data into the time code generator by pressing this button.

15 CTL/TC/U-BIT select switch

Select the time data to be indicated on the time counter display. According to the switch setting, the built-in time code reader reads the data on the tape during playback; and during recording, the recording data is read. The selected data is used for setting the edit data.

CTL: Tape running time in hours, minutes, seconds and frames determined by counting the CTL signal (Editing tape address: CTL)

TC: LTC or VITC time code. Select LTC or VITC with the LTC/VITC switch on the SY-64 board. (Editing tape address: time code)

U-BIT: User bit data in the LTC or VITC (Editing tape address: time code)

- When the REMOTE/LOCAL switch is set to REMOTE 1, the time data (or editing tape address) is selected from the connected unit.

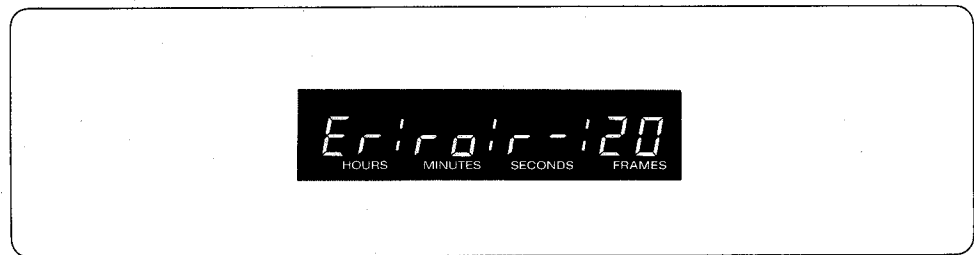
16 Time counter display

The display indicates the CTL, time code or user bit data according to the CTL/TC/U-BIT select switch.

- To display the data from the built-in time code generator, press the REC button in STOP mode when TC or U-BIT is selected.

Error code indication

When an error occurs and normal operation of the VTR is not possible, the corresponding error code number is indicated on the time counter display as shown below.



For the interpretation of the code, refer to the maintenance manual.

17 RESET button

Press this button to reset the data on the time counter display. When the time code or user bit is displayed, this button will reset the time code/user bit generator. When the CTL data is reset, the edit point data entered with the CTL data is deleted as well.

18 Tape transport buttons

STANDBY button

Press this button to set the unit in the STANDBY on/off mode.

STANDBY on mode: The button is lit. The drum is rotating and the tape is tensed.

STANDBY off mode: The button is not lit. The drum stops rotating and the tape tension is released. To set the unit in the STANDBY off mode, press the button in STOP mode.

If the unit is kept in the STOP (STANDBY on) mode for more than 8 minutes, the unit is automatically set in the STANDBY off mode to protect the tape.

- To change the STANDBY off timer setting, refer to the maintenance manual.

PREROLL button

When this button is pressed, the tape runs to the preroll point (5 seconds before the IN point) and stops.

When the button is pressed with the IN, OUT, AUDIO IN or AUDIO OUT button, the point can be cued up.

- To change the preroll time, refer to "SET UP".

REC button

To start recording: Press this button and the PLAY button simultaneously.

To monitor the E-to-E signal: In the STOP mode, press this button. The E-to-E audio and video signal can be monitored. During playback, search, fast forward or rewind, the E-to-E mode picture can be monitored while this button is depressed.

EDIT button

To start manual editing: Press this button simultaneously with the PLAY button while the unit is in the PLAY mode.

To monitor the E-to-E signal: In STOP mode, press this button. The audio and video signal (in the INSERT mode, the selected channel signal) can be monitored. During playback, search, fast forward or rewind, the E-to-E mode video signal can be monitored while this button is depressed.

STOP button

Press this button to stop the tape running. When the unit is set in the STOP (STANDBY on) mode, a still picture can be monitored.

The unit is set in the STOP (STANDBY on) mode when the cassette is inserted.

F.FWD (fast forward) button

Press this button to run the tape fast.

PLAY button

To start playback: Press this button.

To start recording: Press this button and the REC button simultaneously.

When the PLAY button is pressed during recording or manual editing, the mode is cut out and the unit is set in the PLAY mode.

REW (rewind) button

Press this button to rewind the tape.

EJECT button

Press this button to unthread the tape and eject the cassette. When the cassette is ejected, the time data in the time counter display is reset to "0:00:00:00" if the CTL data was selected.

19 SERVO lamp

Lights when the drum servo and capstan servo are locked.

20 REC INHIBIT lamp

Lights or blinks as follows to indicate that recording is inhibited with either the cassette tab or plug or the REC INHIBIT switch on the sub-control panel.

REC INHIBIT switch Cassette tab or plug	ON	OFF
Recording disable	Lit *	Blinks *
Recording enable	Lit	Unlit

21 PLAYER/RECORDER buttons and lamps

When a player VTR is connected to this unit with RS-422A remote cable, select which VTR is to be controlled with the control panel of this unit.

The corresponding lamp lights when the button is pressed.

PLAYER button: Press to control the player VTR connected to the REMOTE 1-OUT connector.

RECORDER button: Press to control the recorder VTR (this unit).

22 Search button

To start SHUTTLE mode playback at the preset speed from the STOP or PLAY mode, press this button.

23 SHUTTLE/JOG lamp

Lights to indicates which mode is selected with the search dial.

* The lamp indication can be changed. Refer to the maintenance manual.

24 Search dial and direction lamps

Rotate the dial to change the playback speed in the SHUTTLE, JOG or capstan override mode. The tape running direction is indicated with the direction lamps: < Reverse, □ Still, > Forward.

(A) SHUTTLE or JOG mode

Select the SHUTTLE mode or JOG mode by pressing the dial. In each mode, the adjustable range is as follows.

SHUTTLE mode (SHUTTLE lamp is lit.): The playback speeds changes according to the rotated angle of the dial from -24 to +24 times normal speed.

At the center position, a still picture is obtained.

JOG mode (JOG lamp is lit.): As the dial is rotated, the playback speed changes according to the speed of dial rotation from 0 to ± 1 time normal speed.

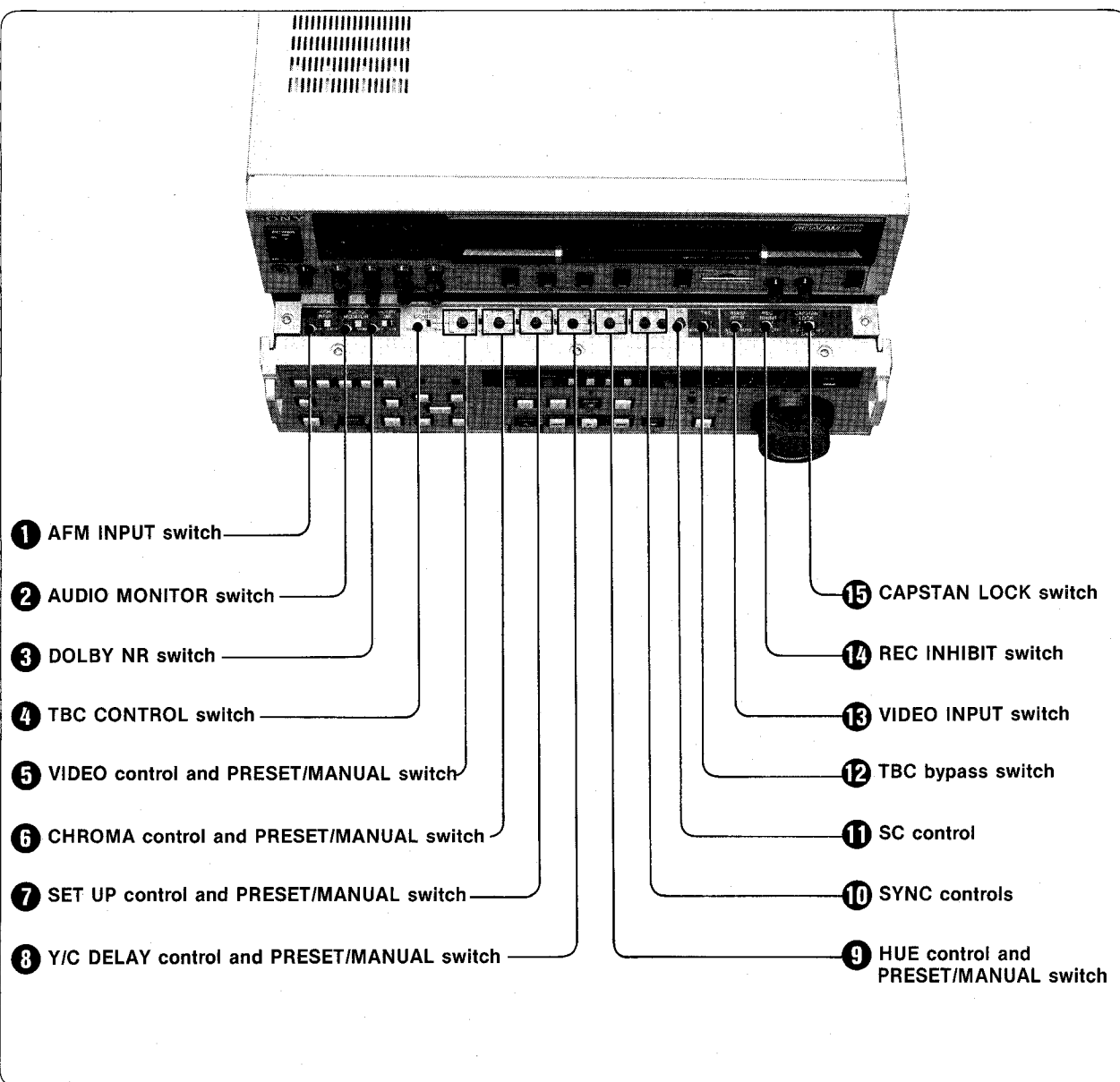
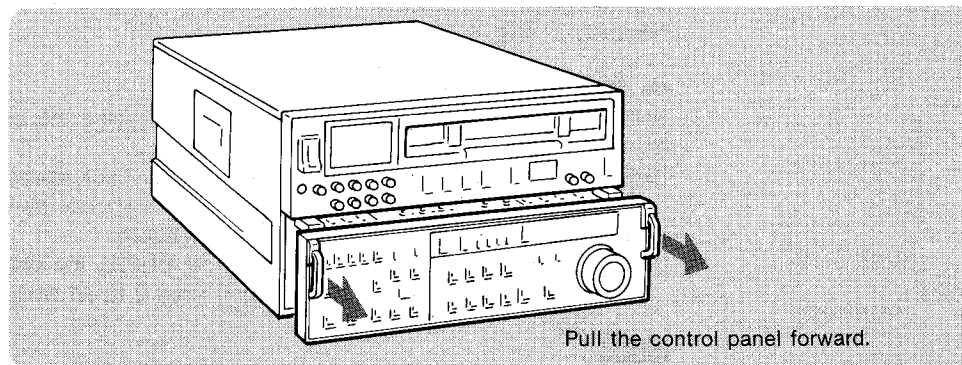
Note

Before starting the SHUTTLE mode playback after the unit is turned on, set the dial at the center position so that the unit detects the center position of the dial and the still lamp □ is lit.

(B) CAPSTAN OVERRIDE MODE

Rotate the search dial while the PLAY button is depressed. The playback speed, determined with the position of the dial (in the SHUTTLE mode) or the rotation speed (in the JOG mode), is adjustable within $\pm 16\%$ times normal speed.

Sub Control Panel



1 AFM INPUT switch

Select the audio signal to be recorded on the chrominance track.

CH-1/2: The signals fed to the AUDIO INPUT CH-1 and CH-2 connectors are recorded on the chrominance track as well as on the LNG track. The signals fed to the AUDIO INPUT CH-3 and CH-4 connectors are not recorded.

CH-3/4: The signals fed to the AUDIO INPUT CH-3 and CH-4 connectors are recorded on the chrominance track.

2 AUDIO MONITOR switch

Select the signals output from the SELECTED CH-1/3 and CH-2/4 connectors when the MONITOR select switch is set to ST/MIX.

ST: Stereophonic signal of the two channels

MONO: Mixed signal of the two channels

- The output signal is fixed to the stereophonic setting regardless of the switch position when item No. 103 in SET UP menu 2 is set to AUTO.

3 DOLBY NR switch

When oxide tape is used, set the switch to ON to record or play back the LNG audio with DOLBY C type noise reduction system.

When metal particle tape is used, the DOLBY NR system is always activated regardless of this switch setting.

4 TBC CONTROL switch

LOCAL: To control the built-in time base corrector on the sub control panel of this unit.

REMOTE: To remotely control the built-in time base corrector with a BK-2006 or BVR-50 remote control unit (optional).

5 VIDEO level control and PRESET/MANUAL switch

Adjust the output video signal level.

MANUAL: The level can be compensated within ± 3 dB with the control.

PRESET: The level is set to the reference level regardless of the control.

6 CHROMA level control and PRESET/MANUAL switch

Adjust the output chroma level.

MANUAL: The level can be compensated within ± 3 dB with the control.

PRESET: The level is set to the reference level regardless of the control.

Note

The output chroma level is adjusted with both the VIDEO control and the CHROMA control. The total adjustment range is, however, within ± 6 dB.

7 SET UP control and PRESET/MANUAL switch

Adjust the set-up level.

MANUAL: The level can be adjusted within ± 15 IRE with the control.

PRESET: The level is set to the reference level regardless of the control.

8 Y/C DELAY control and PRESET/MANUAL switch

Adjust the Y/C delay.

MANUAL: The delay can be adjusted within ± 50 nsec with the control.

PRESET: The delay is set to the preset value regardless of the control.

9 HUE control and PRESET/MANUAL switch

Adjust the output hue (burst and chroma relative phase).

MANUAL: The hue error can be adjusted within $\pm 15^\circ$ with the control.

PRESET: The hue is set to the reference hue regardless of the control.

10 SYNC controls

Adjust the output sync phase with respect to the reference signal input to this unit.

Normally adjust the phase with the FINE control (adjustable range: 300 nsec). For wide range adjustment, use the other control (adjustable range: -1 to $+3 \mu\text{sec}$) together with the FINE control.

11 SC control

Adjust the output subcarrier phase with respect to the reference signal input to the unit. Adjustable range is 360° p-p.

12 TBC bypass switch

Usually set this switch to ON.

When the composite video signal cannot be synchronized with the reference video signal, such as when the signal is transmitted by a microwave link, the E-to-E video signal on the monitor may appear unstable during recording; however, the recording is performed normally. In order to monitor the stable E-to-E video signal, set this switch to BYPASS. To synchronize the signal to the reference video signal, use a frame-synchronizer.

13 VIDEO INPUT switch

Select the position depending on the input signal fed to the VIDEO INPUT connectors at the rear panel.

AUTO: Normally set to this position. The unit automatically detects whether the luminance and chrominance are interleaved normally with each other. If they are not interleaved, the unit is automatically set in the NON STD mode.

NON STD: Set to this position if color-framing information in the input signal is unstable.

14 REC INHIBIT switch

Normally, set this switch to OFF. At the ON position, recording and editing are not possible and the REC INHIBIT lamp on the front panel is lit. When the unit is used for sending out the signals, set the switch to ON.

15 CAPSTAN LOCK switch

Select the capstan servo lock mode for playback or editing.

2FD: Capstan servo locks by 2 fields. Since color framing lock is inhibited, a video output signal phase does not shift horizontally during playback.

- Set to this position (1) when only the non-decoded component signal has been recorded on the tape or (2) when color framing is controlled with an editing controller.

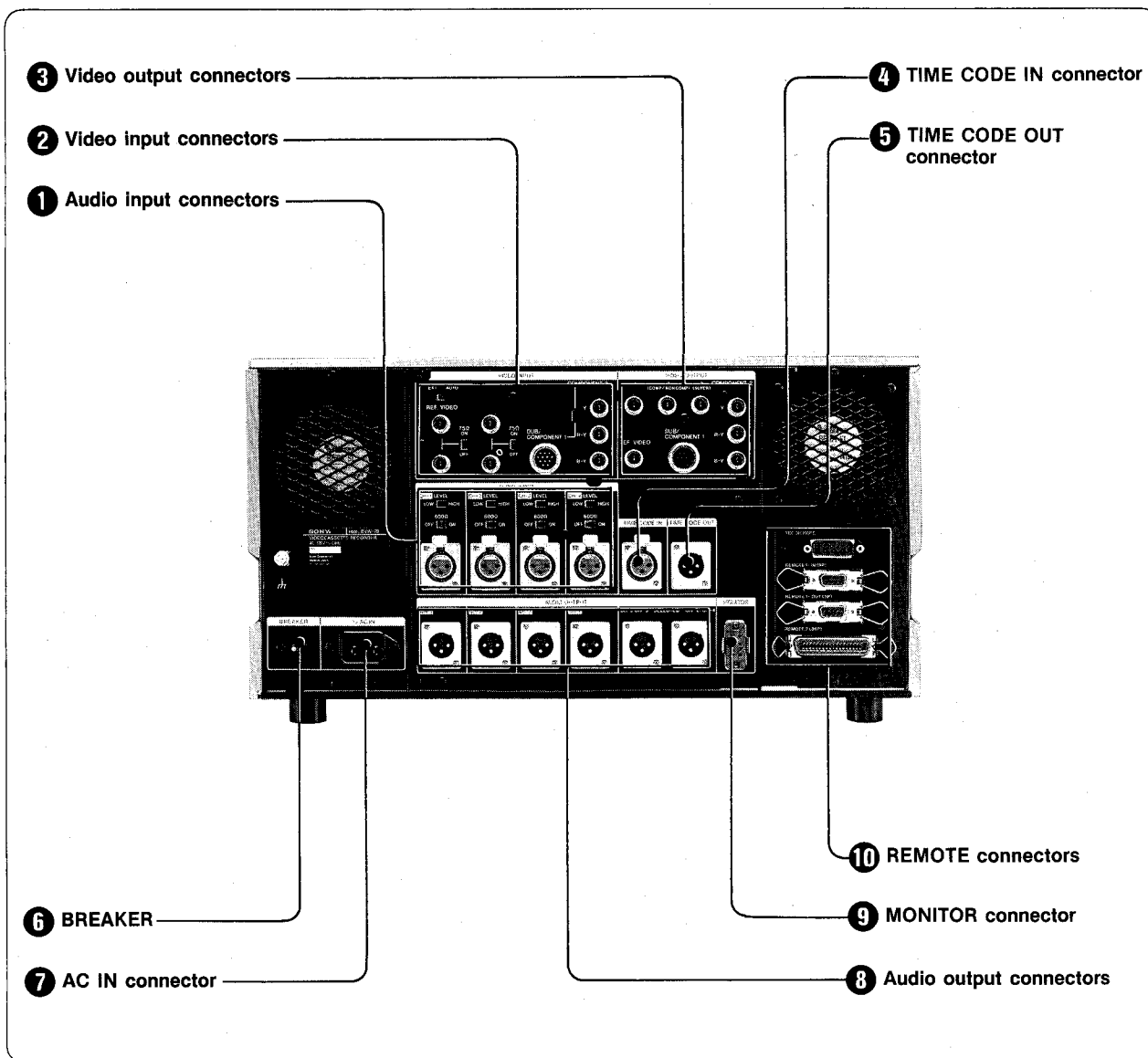
2/4 FD: Capstan servo locks by 2 fields. Difference of the decoding sub-carrier phase and encoding sub-carrier phase is automatically compensated based on the decoding sub-carrier phase with which the signal was recorded. In this case, the output video signal phase may shift 140 nsec at max.

- Set the switch to this position to achieve the best quality of picture and quick editing at the same time, if the shift of the output video phase is permissible.

4 FD: Capstan servo locks by 4 fields. Since capstan servo lock phase with respect to the reference signal is fixed, the amount of the video signal shift is stable for repeated stop and start.

- Set the switch to this position when A/B roll editing is performed or when continuity of the video signal phase at the edit points is required.
- If the video phase is not continuous at the edit points, even though the switch is set to 8 FD, adjust the SC phase and sync phase with the SC phase control and SYNC phase control on the sub control panel of the player.

Connector Panel



1 Audio input connectors

LEVEL select switches

Set to the appropriate position according to the input level.

LOW: -60 dBm (for microphone input)

HIGH: +4 dBm (for line input)

600 Ω termination switches

Select the input impedance. The impedance is varied depending on the LEVEL select switch setting.

600 Ω	LEVEL	
	LOW	HIGH
ON	600 ohms	600 ohms
OFF	3 kohms	10 kohms

AUDIO INPUT CH-1/CH-2/CH-3/CH-4 connectors (XLR 3-pin)

Connect the audio signals from the player VTR, microphone or other audio equipment.

2 Video input connectors

REF. VIDEO (reference video) select switch

Select the reference signal for playback, recording or editing.

EXT: The external reference signal fed to the REF. VIDEO input connector

AUTO: The video signal fed to the REF. VIDEO input connector or the video signal fed to the DUB/COMPONENT 1 input connector is automatically used as the reference signal. Normally, set the switch to AUTO.

REF. VIDEO (reference video) input connectors (BNC type) and 75 Ω termination switch

Connect a reference video (VBS) signal having the burst and composite sync signal. When both connectors are used for a bridging connection, set the 75 Ω termination switch to OFF. Normally, set the switch to ON.

VIDEO INPUT connectors (BNC type) and 75 Ω termination switch

Connect a composite video signal.

When both connectors are used for a bridging connection, set the 75 Ω termination switch to OFF. Normally, set the switch to ON.

DUB/COMPONENT 1 input connector (12-pin)

Connect the component video (Y/R-Y/B-Y or Y/CTDM) signal from the BVW-10, 15, 35, 40, 70 or BVW-75 with the 12-pin dubbing cable (supplied).

COMPONENT 1/2 connector select switch

COMPONENT 1: Set to this position when the Y/R-Y/B-Y or Y/CTDM signals are fed to the DUB/COMPONENT 1 connector.

COMPONENT 2: Set to this position when the Y/R-Y/B-Y signals are fed to the COMPONENT 2 connector.

COMPONENT 2 connectors (BNC type)

Connect the Y/R-Y/B-Y signal. These connectors are internally terminated with 75 ohms.

3 Video output connectors

VIDEO OUTPUT connectors (BNC type)

Composite video signal is supplied. Connect to the video input connector of a VTR or a video monitor.

- By setting the internal switch, a NON-COMPOSITE video signal can be supplied from the VIDEO OUTPUT 2 connector. Refer to the maintenance manual for details.
- When the CHARACTER switch on the SY-61 board is set to ON, the time code, SET UP menu, VTR operation mode or error message can be superimposed on the signal output from the VIDEO OUTPUT 3 connector. Refer to "SET UP".

REF. VIDEO (reference video signal) output connector (BNC type)

The output signal from the built-in black burst generator is supplied. When an external reference signal cannot be obtained, connect this connector to the REF. VIDEO IN or EXT. SYNC IN connector on the player VTR.

DUB/COMPONENT 1 output connector (12-pin)

The component video (Y/R-Y/B-Y or Compressed Time Division Multiplex) signal is supplied.

To dub or to edit a video signal to another BWV-70, connect to the DUB/COMPONENT 1 input connector of the other BWV-70 with the 12-pin dubbing cable (supplied).

COMPONENT 2 connector (BNC type)

The component video (Y/R-Y/B-Y) signals are supplied.

4 TIME CODE IN connector (XLR 3-pin)

Connect an external time code generator or another VTR for recording the external time code signal.

5 TIME CODE OUT connector (XLR 3-pin)

During playback, the playback time code directly off the tape or regenerated by the internal time code generator is supplied. During recording, the time code signal fed to the TIME CODE IN connector or the time code from the built-in time code generator is supplied.

6 BREAKER

Circuit breaker. If the breaker trips, the AC power is cut off completely.

7 AC IN connector

Connect to an AC power source with the AC power cord (supplied).

8 Audio output connectors

AUDIO OUTPUT CH-1/CH-2/CH-3/CH-4 connectors (XLR 3-pin)

The line output level can be adjusted with the PB level controls on the front panel.

SELECTED OUTPUT CH-1/CH-3 and CH-2/CH-4 connectors (XLR 3-pin)

The audio signals selected by the MONITOR switches on the front panel are supplied. Connect to the audio monitoring equipment. The output level of these connectors is adjusted with the HEADPHONES level control.

When the item number 103 in SET UP menu 2 is set to AUTO, the LNG or AFM audio is automatically selected depending on the tape.

Oxide tape	CH-1/2 (Stereophonic)
Metal particle tape	CH-3/4 (Stereophonic)

The output signal level is fixed to the reference level.

9 MONITOR connector (8-pin)

The video and audio signals are simultaneously supplied. Connect to a video monitor with a monitor connecting cable (optional). The audio signals are selected with the MONITOR switches.

- When the CHARACTER switch on the SY-61 board is set to ON, the time code, SET UP menu, VTR operation mode or error message can be superimposed on the signal output from the MONITOR connector. Refer to "SET UP."

10 REMOTE connectors

REMOTE 1-IN/OUT connectors (9-pin)

Connect another BVW-70, another VTR or an editing control unit with RS-422A serial remote control interface.

The OUT connector is equipped for bridging connection.

Connectable equipment

"Betacam SP" VTR: BVW-75, BVW-65, BVW-60, BVW-35

Betacam VTR: BVW-40, BVW-25, BVW-15 or BVW-10

U-matic VTR: BVU-800, BVU-820 or BVU-950

1-inch helical scan VTR: BVH-2000 series VTR or BVH-3000, 3100

Editing control unit: BVE-800, 900, 3000A, 5000 or 9000

REMOTE 2 connector (36-pin)

Connect a BVE series editing control unit such as a BVE-500A with parallel input/output remote control signal through a 36-pin remote control cable (optional).

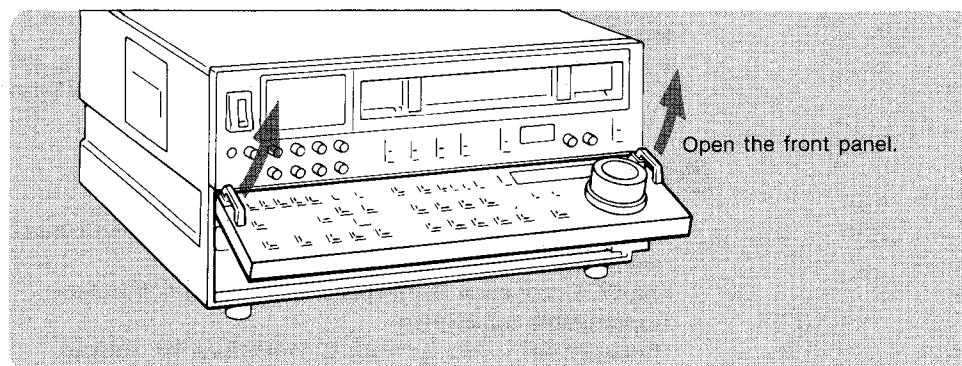
TBC REMOTE connector (15-pin)

To remotely control the built-in time base corrector, connect an optional BK-2006 or BVR-50 remote control unit.

Note

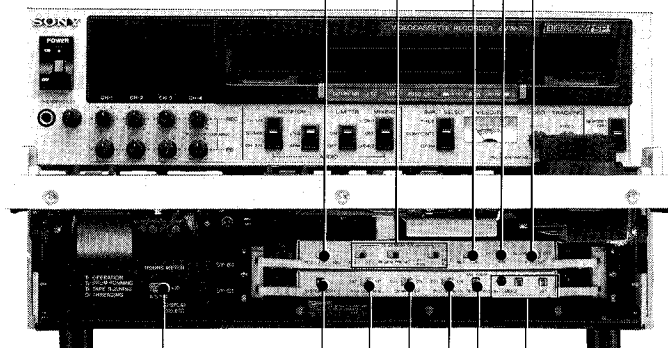
Before connecting a remote control unit to the TBC REMOTE connector, be sure to turn off the power of this unit.

Internal Boards



SY-64 board

- ② TC GENERATOR switches
- ① VITC/AUTO/LTC switch
- ③ NDF/DF switch
- ④ VITC switch
- ⑤ ID PRESET switch



- ⑥ Digital hours meter

SY-61 board

- SYSTEM RESET switch*
- ⑦ VTR CONTROL switch
- ⑧ CHARACTER switch
- ⑩ SYSTEM SET-UP buttons
- REEL POSITION switch*
- ⑨ SYNCHRONIZE switch

* These switches are for service control. For details, refer to the maintenance manual. When the SYSTEM RESET switch is pressed, the unit is reset to the condition it was in when the power was turned on.

① VITC/AUTO/LTC switch

Select the time code/user bit to be read and displayed during playback. Factory preset to LTC.

VITC: VITC time code/user bit

AUTO: Within $\pm 1/2$ time normal speed, VITC time code/user bit is read and, at other speeds, the LTC time code/user bit is read.

LTC: LTC time code/user bit

② TC GENERATOR switches

INT/EXT switch

Select the internal/external time code. Factory preset to INT.

EXT: The time code fed to the TIME CODE IN connector is recorded.

INT: The time code generated from the built-in time code generator is recorded.

REGEN/PRESET switch

Factory preset to PRESET.

REGEN: The built-in time code generator is locked to the time code read by the reader.

PRESET: The built-in time code generator can be preset.

REC RUN/FREE RUN switch

Factory preset to FREE RUN.

REC RUN: The built-in time code generator generates the data only in the REC mode.

FREE RUN: The generator runs at any time as long as the power is turned on.

Note

The REC RUN mode can be selected only when the INT/EXT switch is set to INT and REGEN/PRESET switch is set to PRESET.

③ NDF/DF switch

Factory preset to DF.

NDF: The built-in time code generator and CTL counter operate in the non-drop frame mode.

DF: The built-in time code generator and CTL counter operate in the drop frame mode.

Note

When REGEN/PRESET switch is set to REGEN, the NDF/DF switch does not function. The generator is locked to the time code read by the reader.

④ VITC switch

Factory preset to ON.

OFF: VITC generated from the built-in time code generator is not recorded. However, VITC is recorded if the input video signal includes VITC.

ON: The VITC generated from the built-in time code generator is recorded.

• To select the lines for VITC insertion, refer to the maintenance manual.

⑤ ID PRESET switch

Set the switch to ON to record the ID code in the user bit area of the LTC and VITC. To preset the ID code, refer to the maintenance manual for details.

6 Digital hours meter

Indicates the accumulated time while the unit is turned on, the drum is rotating, or the tape is running and the total times of tape threading/unthreading.

7 VTR CONTROL switch

Factory preset to INT.

INT: Normally set the switch to this position.

EXT: Select this position to control the unit with the optional BVR-75 control panel connected with the extension cable (10-pin).

8 CHARACTER switch

Factory preset to ON.

ON: To superimpose the time data, SET UP menu, error code and VTR status on the monitors connected to the VIDEO OUTPUT 3 connector and MONITOR (8-pin) connector.

OFF: The characters are not superimposed.

- The data superimposed and character size and position are selected in SET UP menu 1.

9 SYNCHRONIZE switch

This switch controls only built-in synchronization function for machine to machine editing.

ON: This unit (recorder VTR) synchronizes to the connected VTR (player VTR).

OFF: The two VTRs are not synchronized.

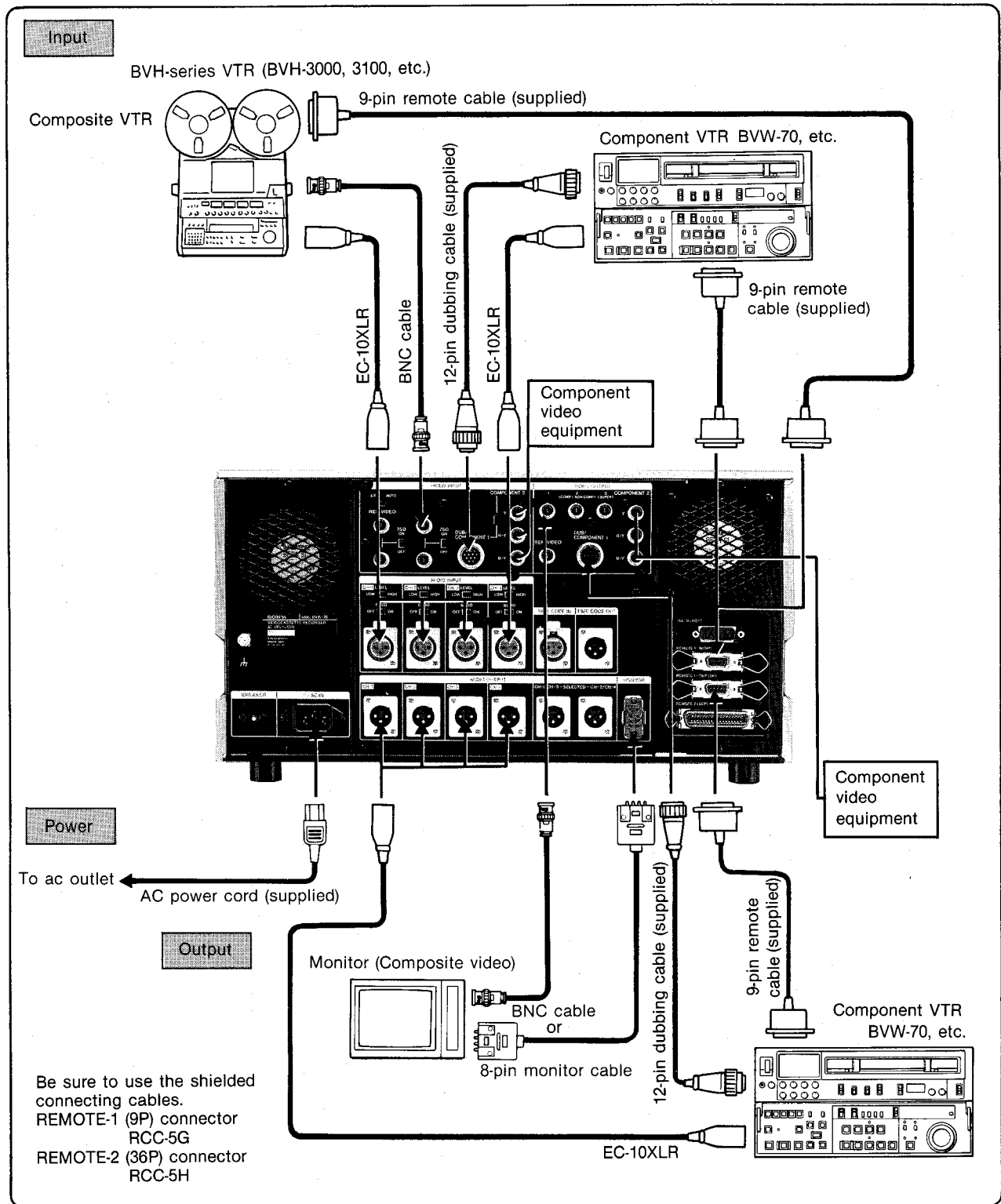
10 SYSTEM SET-UP buttons

MENU: Press this button to start setting in the SET UP menu 1 and 2. The MENU lamp lights. For details of SET UP menu 2, refer to the maintenance manual.

SET: After setting the data, press this button to register the data. The MENU lamp goes off.

CONNECTIONS

Connections of Video and Audio Equipment



For the reference signal, refer to "Connection of the Reference Signal".

Switch Setting of the Connector Panel

REF. VIDEO 75 Ω termination switch

ON: For normal use
OFF: For bridging connection of the reference signal

VIDEO INPUT 75 Ω termination switch

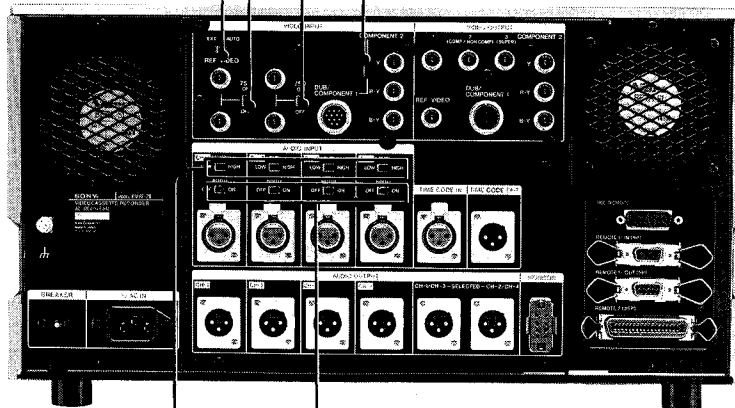
ON: Normally, set to ON
OFF: For bridging connection of the video input signal

REF. VIDEO select switch

AUTO: For normal use
EXT: For using an external reference signal at any time

COMPONENT 1/2 select switch

1: For using DUB/COMPONENT 1 connector
2: For using COMPONENT 2 connector



LEVEL switch

LOW: For microphone input
HIGH: For line input

600 Ω termination switch

ON: For audio input signal of 600 ohms input impedance
OFF: For audio input signal of 10 kohms or 3 kohms impedance

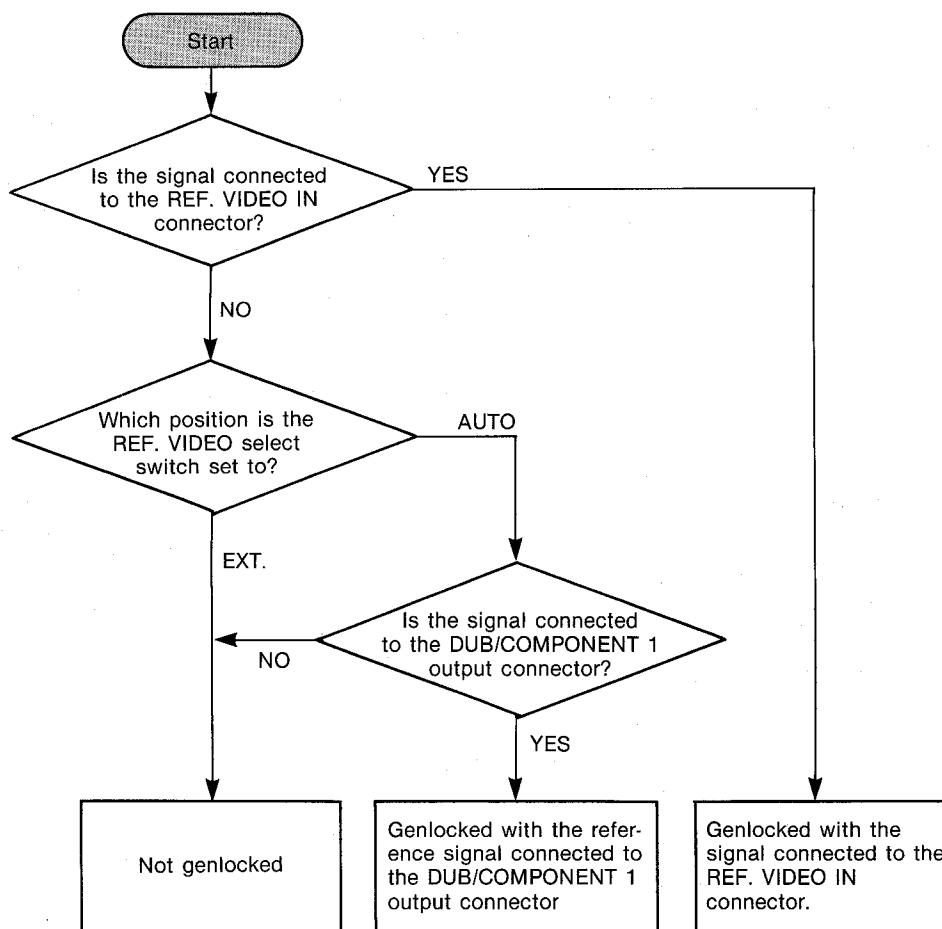
REFERENCE SIGNAL FOR BUILT-IN TIME BASE CORRECTOR AND SERVO SYSTEM

Reference Signal from the Built-in Black Burst Generator

The BVW-70 is equipped with a black burst signal generator so that editing can be performed without supplying an external reference signal. The output signal of the signal generator is supplied to the built-in TBC and the servo circuit and also to the REF. VIDEO OUTPUT connector on the connector panel. If an external reference signal for the editing system for tape-to-tape editing cannot be obtained, connect the REF. VIDEO OUTPUT connector to the REF. VIDEO IN or EXT. SYNC IN connector on another VTR. When two BVW-70s are connected with the 12-pin dubbing cable (supplied), the reference signal from the recorder will be supplied to the player through the dubbing cable.

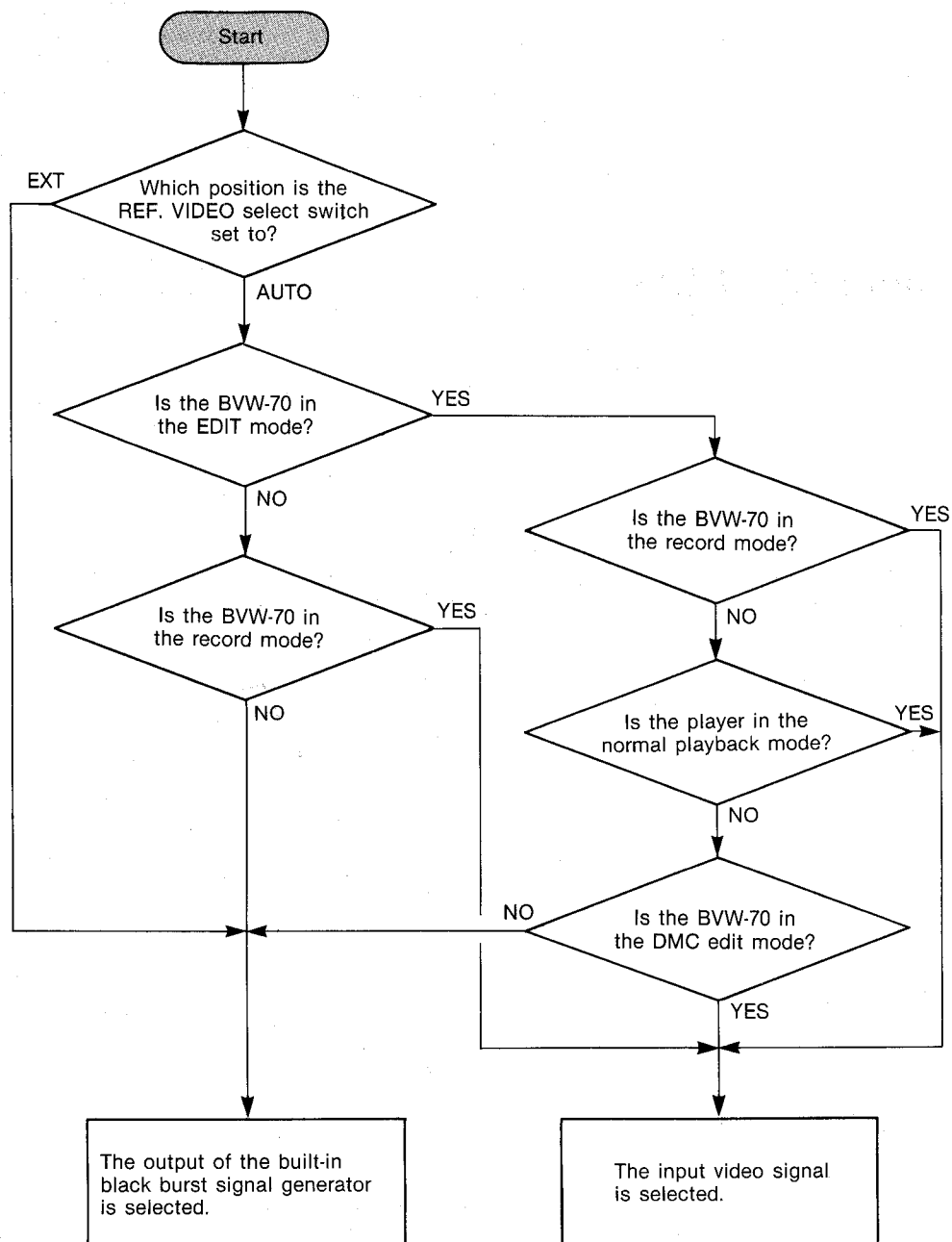
Genlock of the Built-in Black Burst Generator

The built-in black burst generator will lock with an external reference signal if it is supplied. The following chart shows which signal is used as the reference signal.



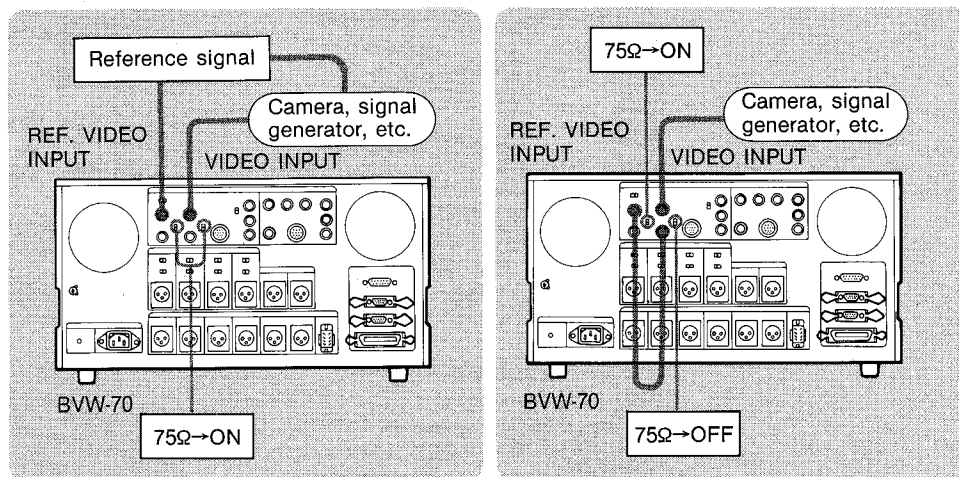
Selection of the Reference Signal for the Servo System

The reference signal for the servo system will be automatically selected from the input video signal (selected by the INPUT SELECT switch) or from the output of the built-in black burst generator. The following chart shows which signal is selected.

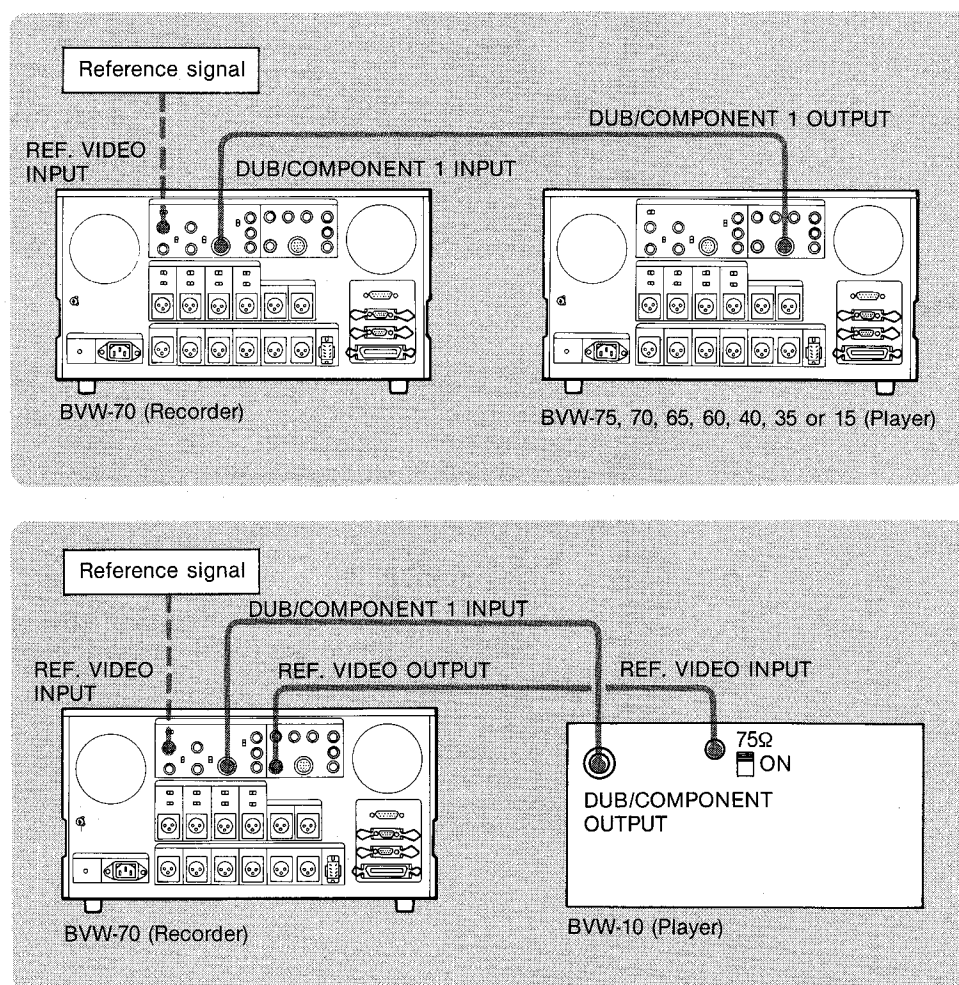


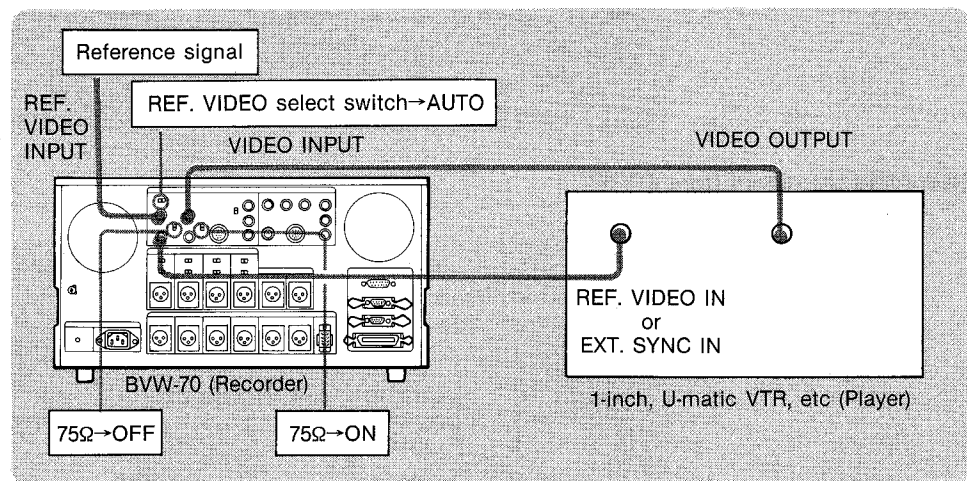
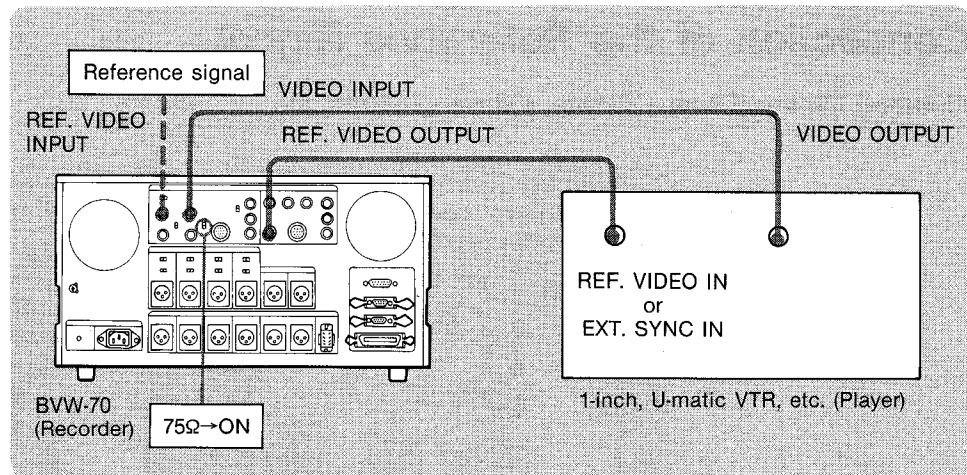
Connection of the Reference Signal

Recording the signal from a camera, a signal generator, etc.

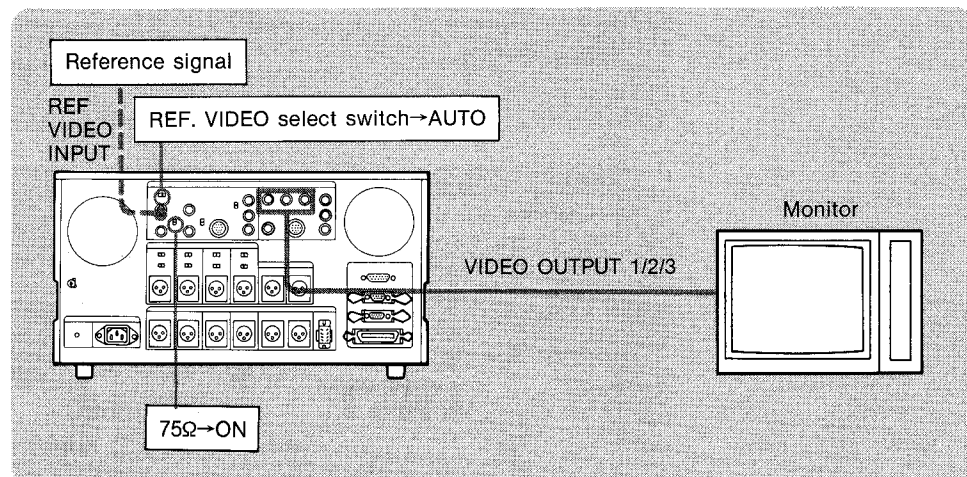


Recording the signal from a VTR





Playback



SET UP

Before operating this unit, revise settings in SET UP menu 1, if necessary.

Items in SET UP menu 1

SET UP menu 1 has 8 items that can be set. To make the settings, select one data number for each item shown in the chart below.

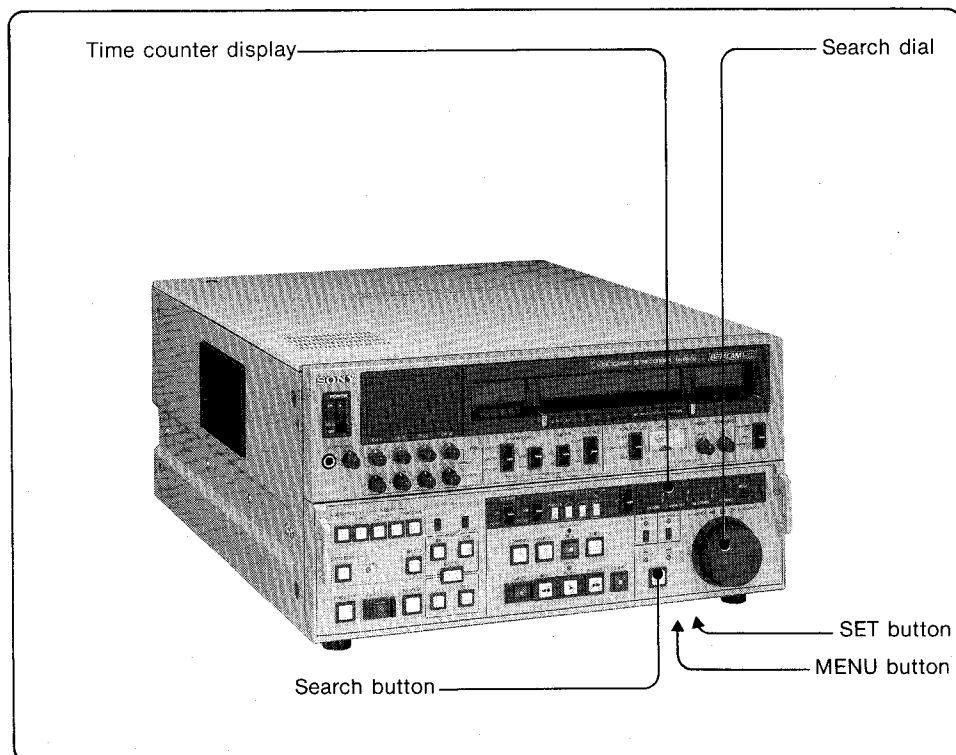
Item No. / name	Data No.	Contents
001/ PREROLL TIME	0 to 15	Preroll time can be changed from 0 to 15 seconds by one second. Set the preroll time to 3 seconds or more for editing. Factory preset: 05 (5 sec).
002/ CHARACTER H-POSITION*	0 to 15	Adjust the horizontal position of the characters superimposed on the signal output from the VIDEO OUT-3 and MONITOR connectors. As the data number increases, characters move to the right. Factory preset: 04
003/ CHARACTER V-POSITION*	0 to 15	Adjust the vertical position of the characters superimposed on the signal output from the VIDEO OUT-3 and MONITOR connectors. As the data number increases, characters move down. Factory preset: 12
004/ CHARACTER V-SIZE*	0 1	Adjust the vertical size (height) of the characters superimposed on the signal connected to the VIDEO OUT-3 and MONITOR connectors. Factory preset: 0
005/ DISPLAY INFORMATION SELECT	0 1	Select the data output from the VIDEO OUT-3 and MONITOR connectors when the CHARACTER switch on the SY-61 board is set to ON. Data No. 0: Time data, error code, setting of the SET UP menu and VTR status Data No. 1: Time data Factory preset: 0
006/ LOCAL FUNCTION ENABLE	0 1 2	Select the buttons on the control panel to be enabled when the REMOTE/LOCAL select switch of the VTR is set to REMOTE. Data No. 0: All the buttons are disabled. Data No. 1: Only the STOP and EJECT buttons are enabled. Data No. 2: All the buttons except RECORDER and PLAYER buttons are enabled. Factory preset: 1

* Adjust the character size and position with the item 002, 003 and 004 while monitoring the characters on the monitors.

Item No. / name	Data No.	Contents
007/ TAPE TIMER DISPLAY	0 1	When CTL is selected with the CTL/TC/U-BIT select switch, select how to display the data. Data No. 0: $\pm 12H$ Data No. 1: 24H Factory preset: 0
008/ MONITORING SELECTION FOR VTR-TO-VTR EDITING	0 1	In recorder-player editing, if a monitor is connected only to the recorder, select whether the recorder is set in the forced E-to-E mode by pressing the PLAYER button to monitor the player's signal. Data No. 0: The recorder will not be in the forced E-to-E mode. Data No. 1: The recorder will be in the forced E-to-E mode and the player's signal can be monitored. Factory preset: 0

To change the setting

To change a setting in SET UP menu 1, proceed as follows.

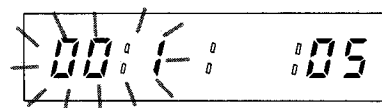


1 Press the SYSTEM SET UP MENU button on the SY-61 board. (MENU lamp lights.)

The item number and data number are displayed on the time counter display

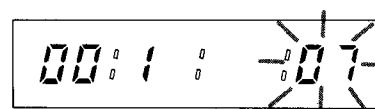
2 To select the item, rotate the search dial.
Rotate the dial clockwise to increase the item number and counterclockwise to decrease the number.

Item number (Blinks.)



3 To change the data number, rotate the search dial while the search button is depressed.
Rotate the dial clockwise to increase the data number and counterclockwise to decrease the number.

Data number changes.



4 When the desired data is selected, release the search button.

The item number blinks again.

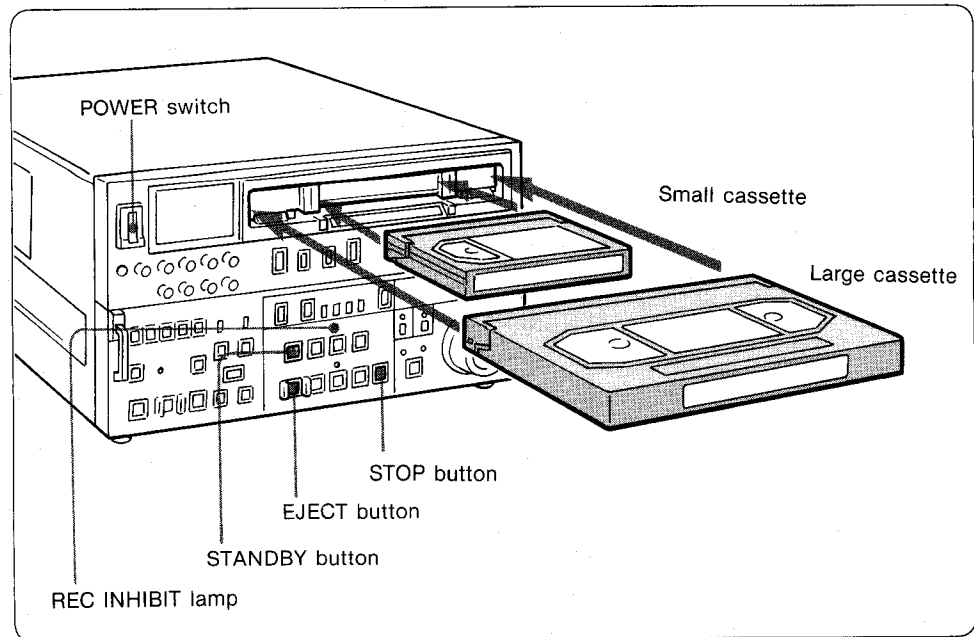
Repeat steps 2 to 4 to change the settings of other desired items.

To cancel the new data and recall the previous data, press the SYSTEM SET UP MENU button again before pressing the SET button.

5 When the setting is finished, press the SYSTEM SET UP SET button on the SY-61 board.
(MENU lamp goes off.)

CASSETTE INSERTION

To insert and eject the cassette



To insert the cassette

1 Set the POWER switch to ON.

2 Insert the cassette.

- To insert the small cassette, place the cassette at the center of the cassette compartment, aligning with the marks on the compartment window.

The tape is loaded automatically and the drum starts rotating. The STOP and STANDBY buttons light.

When a cassette is inserted, the orange lock-out bar appears to prevent another cassette from being inserted.

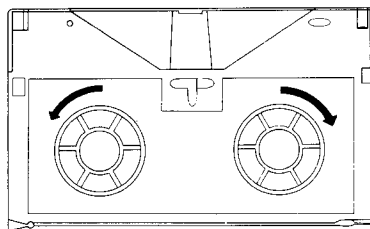
To eject the cassette

Press the EJECT button.

The tape is unthreaded and the cassette is ejected.

Note

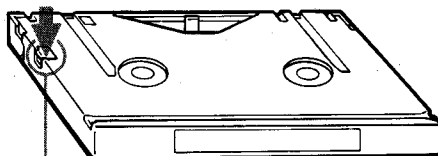
Be sure to take up any slack in the cassette tape before use.



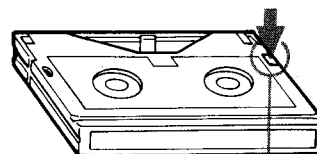
REC INHIBIT mode of the cassette

To safeguard the material previously recorded on a cassette, set the cassette in the REC INHIBIT mode as follows. When a cassette in the REC INHIBIT mode is inserted, the REC INHIBIT lamp lights.

Large cassette

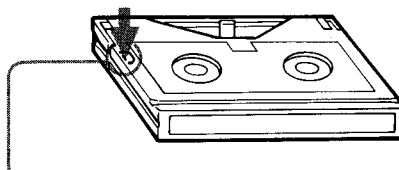


Small size metal particle tape cassette



Push down the plug (REC INHIBIT ON).
To enable recording, pull up the plug (REC INHIBIT OFF).

Small size oxide tape cassette

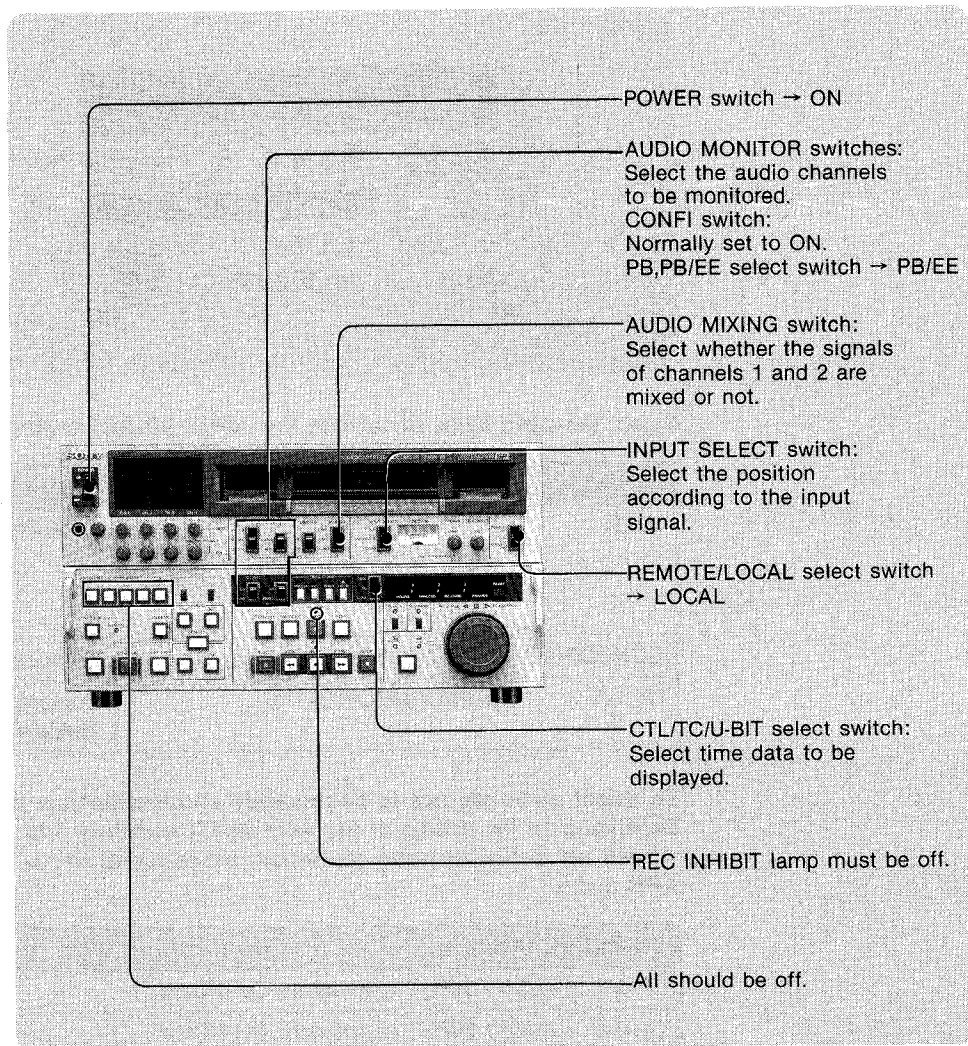


Break off the tab with a screw driver.
To enable recording, cover the hole with cellophane tape.

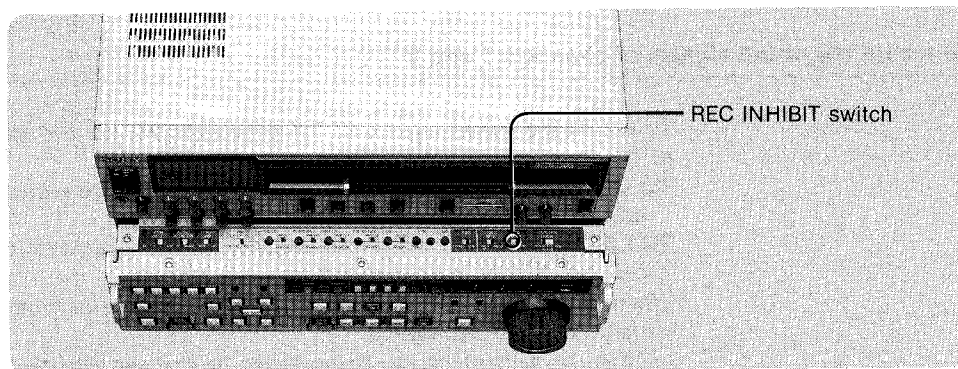
RECORDING

Preparation

Make the following settings before operation.



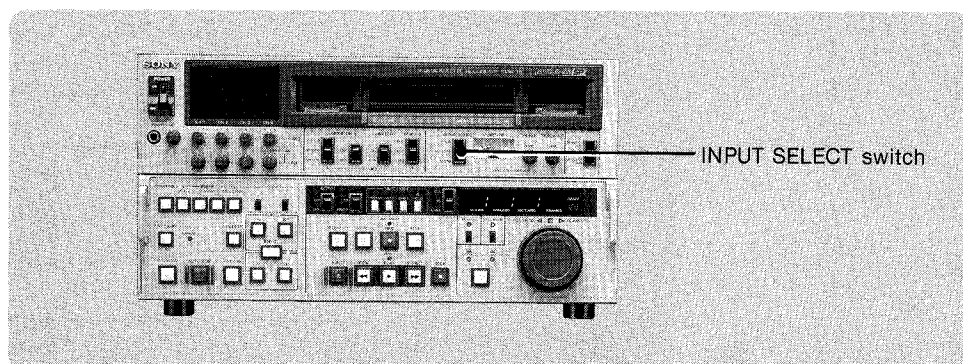
If the REC INHIBIT lamp is lit



Set the REC INHIBIT switch on the sub control panel to OFF to enable recording. Or, check that recording is not inhibited on the inserted cassette.

To select the video and audio input signals

To select the video input signal



Select the video input signal with the INPUT SELECT switch as follows.

Setting	Connector	Input signal
Y-R,B	DUB/COMPONENT 1 or COMPONENT 2 (Select with the COMPONENT 1/2 select switch at the rear.)	Component signal (Y/R-Y/B-Y)
COMPOSITE	VIDEO INPUT connector	Composite video signal
CTDM	DUB/COMPONENT 1	Compressed Time Division Multiplex (Y/CTDM) signal

To select audio signals to be recorded on chrominance track

Depending on the setting of the AFM INPUT switch on the sub control panel, the signals fed to the following connectors are recorded on the chrominance track as the AFM audio.

Setting	Connector
CH-1/2	AUDIO INPUT connectors CH-1/CH-2
CH-3/4	AUDIO INPUT connectors CH-3/CH-4

On the longitudinal track, signals input to the AUDIO INPUT connectors CH-1/CH-2 are always recorded.

To record the mixed signals of channels 1 and 2

To record the mixed signals of the two channels, set the MIXING switch to TO CH-1 or TO CH-2.

TO CH-1: The mixed signals of channels 1 and 2 are recorded on channel 1. On channel 2, only the channel 2 signal is recorded.

TO CH-2: The mixed signals of channels 1 and 2 are recorded on channel 2. On channel 1, only the channel 1 signal is recorded.

When the MIXING switch is set to OFF, the signals of channels 1 and 2 are recorded on each channel separately.

- The mixing ratio of the two channels can be changed with the REC level controls. The ratio is 1:1 when the level controls are set to pushed-in position.

To select the signals to be monitored

To monitor the simultaneous playback

Set the CONF1 switch to ON.

Just after the signal has been recorded, the signal is played back and output from the output connectors of each channel.

When the switch is set to OFF, video and LNG audio E-to-E signals are monitored during recording.

To monitor the E-to-E signal in STOP, STANDBY, rewind or fast forward mode

Set the PB,PB/EE select switch to PB/EE.

When the switch is set to PB, audio and video playback signals are monitored.

To select the audio channels to be monitored

Select the audio channels to be monitored through the HEADPHONES jack, MONITOR (8-pin) connector and SELECTED connectors with the MONITOR switches set as follows.

Connectors MONITOR switches *		HEADPHONES	MONITOR	SELECTED
CH-1/3	LNG	CH-1	CH-1	CH-1
	AFM	CH-3	CH-3	CH-3
ST/MIX	LNG	CH-1/2 (Stereophonic)	CH-1/2 (Mixed)	CH-1/2 (Stereophonic **)
	AFM	CH-3/4 (Stereophonic)	CH-3/4 (Mixed)	CH-3/4 (Stereophonic **)
CH-2/4	LNG	CH-2	CH-2	CH-2
	AFM	CH-4	CH-4	CH-4

Note

When oxide tape is used, the AFM signal is not available.

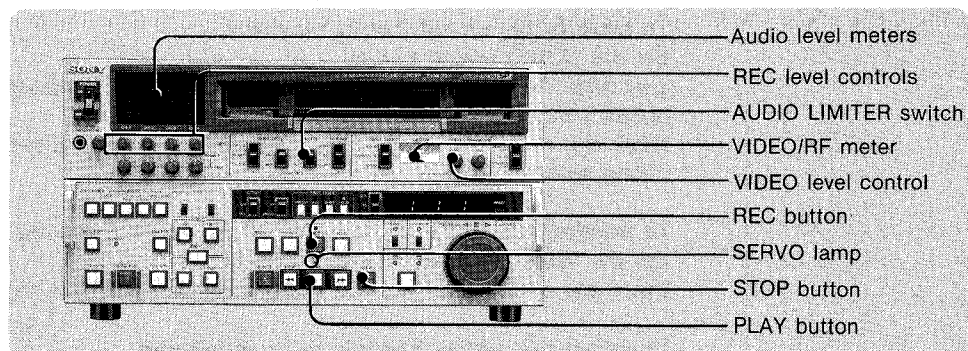
*When the item number 103 in SET UP menu 2 is set to AUTO, LNG or AFM audio is automatically selected regardless of the MONITOR switch setting depending on the tape.

**This signal can be changed to the mixed signal with the AUDIO MONITOR switch on the sub control panel.

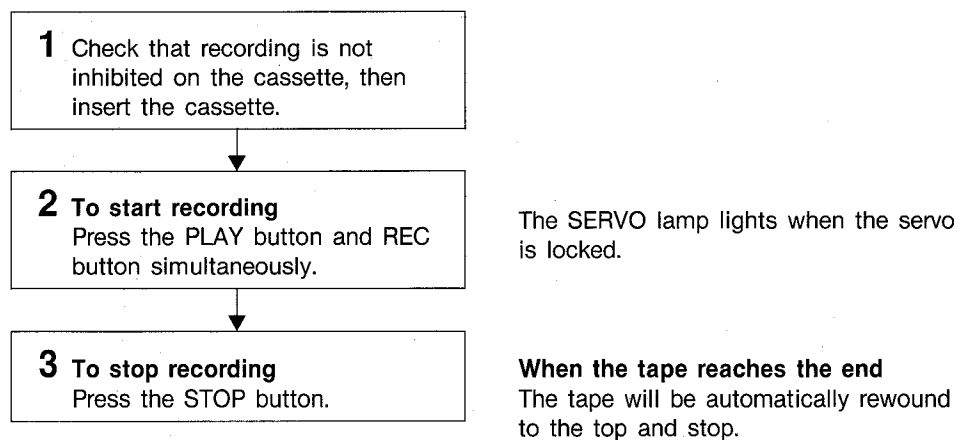
Connectors Tape	HEADPHONES	MONITOR	SELECTED
Oxide tape	CH-1/2 (Stereophonic)	CH-1/2 (Mixed)	CH-1/2 (Stereophonic)
Metal particle tape	CH-3/4 (Stereophonic)	CH-3/4 (Mixed)	CH-3/4 (Stereophonic)

Audio signal output from the HEADPHONES and SELECTED connectors are always stereophonic. For details, refer to the maintenance manual.

Operation



Recording operation



Adjustment

To adjust the video recording level

When the video signal is at an appropriate level, the pointer of the VIDEO/RF meter points in the blue zone.

(A) Setting to the reference level: Set the VIDEO level control to the pushed-in position.

(B) Manual adjustment: Pull out the VIDEO level control and adjust the level.

Note

The component video (Y/R-Y/B-Y or Y/CTDM) signals cannot be adjusted manually.

To adjust the audio recording level

(A) Setting to the preset level (0 VU at +4 dBm input): Set the REC level controls to the pushed-in position.

(B) Manual adjustment:

- 1** Set the LIMITER switch to OFF.
- 2** Pull out the REC level controls and adjust the level so that the audio level meters read approximately 0 VU at the maximum deflection*.
- 3** To record the audio signal on the channels 1 and 2 using the limiter circuit, set the LIMITER switch to ON.

*When the audio level meter is peak meter, adjust the audio level so that the indication "OVER" will not light.

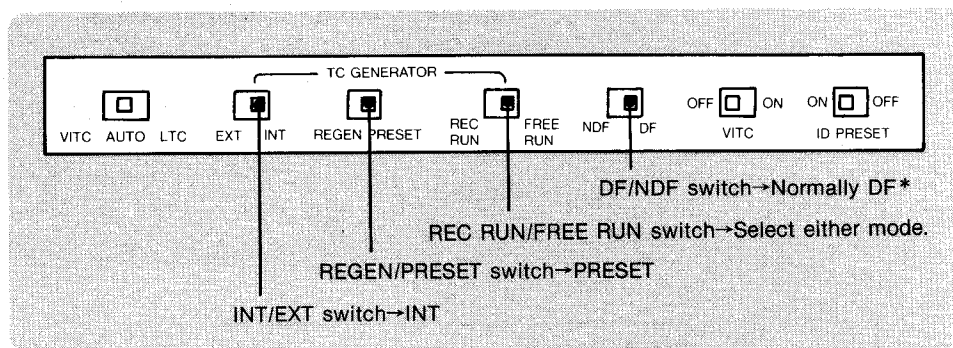
Time Code/User Bit Recording

With this unit, either the internal time code from the internal time code generator or the external time code fed to the TIME CODE IN connector can be recorded. The internal time code generator can be preset or can be slave-locked to the external time code.

To record the preset internal time code

Switch setting on the SY-64 board

Set the switches as follows before presetting the data.

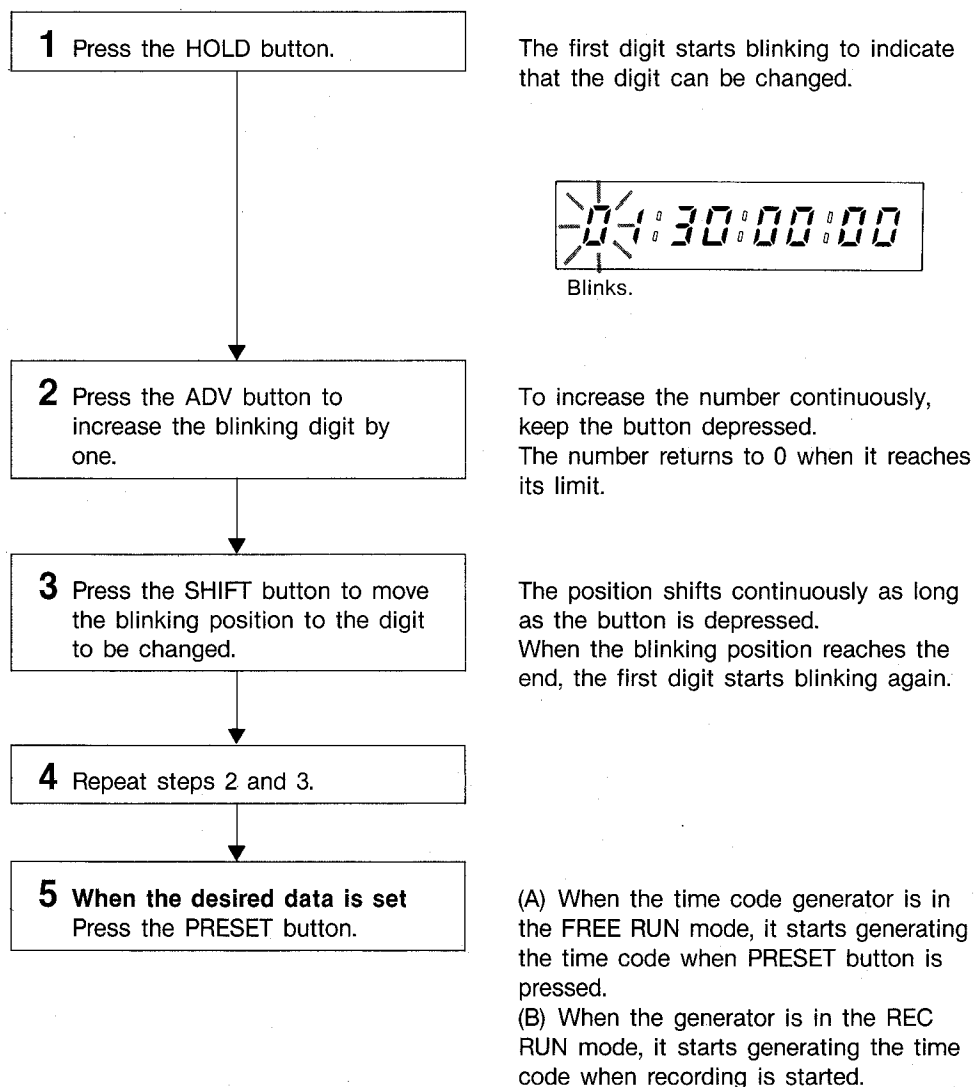
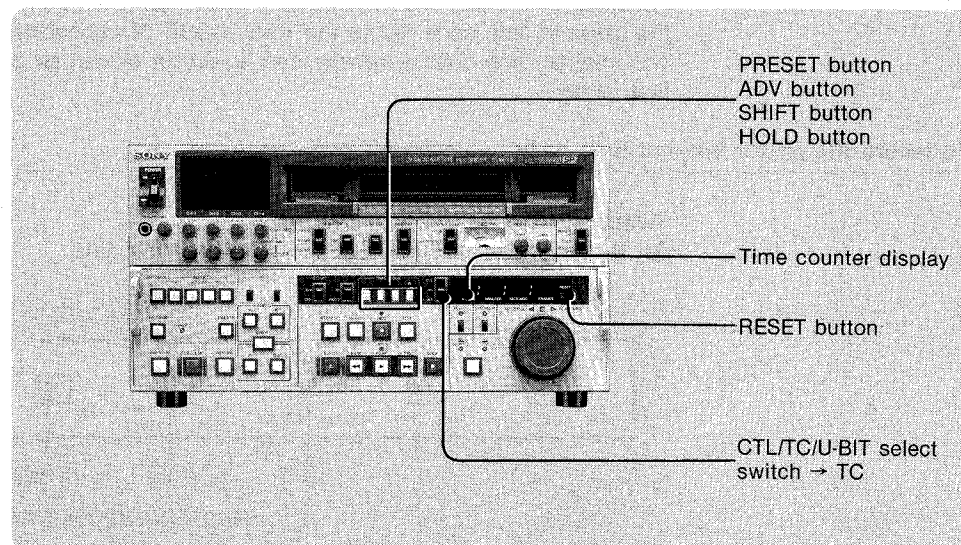


To access the SY-64 board

Lift up the control panel so that the panel is almost horizontal.

* DF: Drop frame mode
NDF: Non-drop frame mode

To preset the time code
Set the data as follows.



To reset the time code generator

Press the RESET button when the time code is displayed on the time counter display.

To record the time of the day

Set the REC RUN/FREE RUN switch to FREE RUN and preset the time of the day.

To set the user bit data

Set the CTL/TC/U-BIT select switch to U-BIT.

Using the HOLD, SHIFT, ADV and PRESET buttons in the same way as in presetting the time code data, set the user bit data in hexadecimal notation.

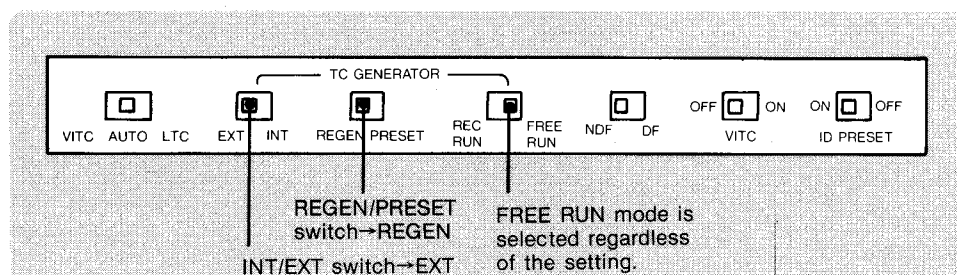
To record the time code locked to the external time code

It is recommended to generate the time code with the internal time code generator which is locked with the external time code, and to record it. Then the deterioration of the time code signal can be avoided when recording the playback time code output from another VTR.

- 1 Feed the external time code from an external time code generator (or another VTR) to the TIME CODE IN connector.

- 2 Set the switches on the SY-64 board as follows.

The internal time code generator is slave-locked to the external time code. Then, the external time code generator can be disconnected, if necessary.



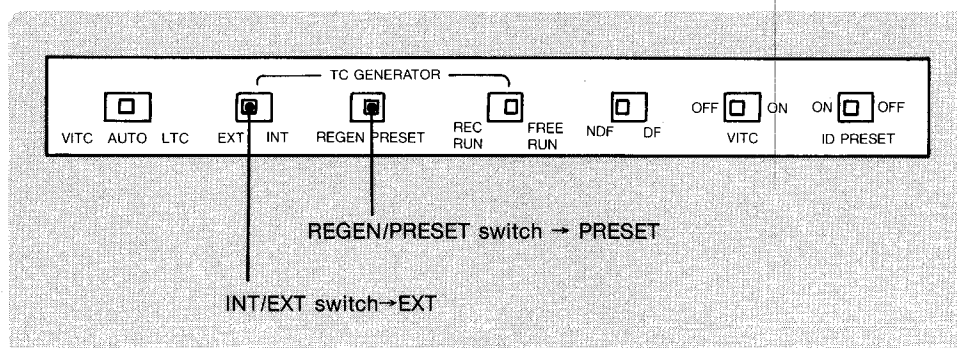
To check the generated data

Set the VTR in the STOP mode and press the REC button. The data generated by the internal time code generator is displayed on the time counter display.

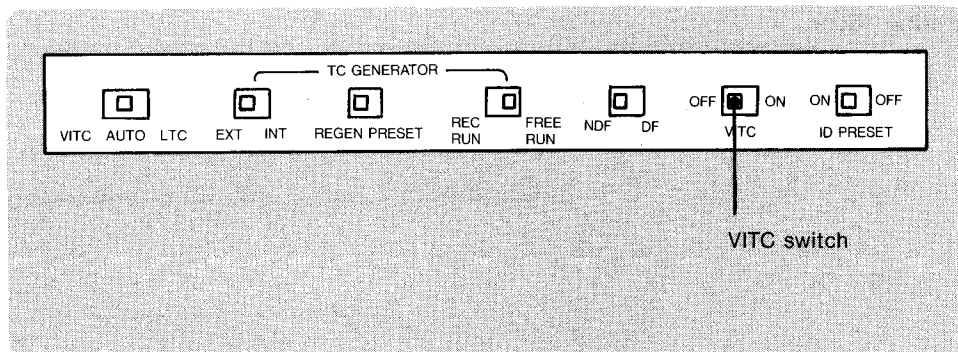
To record the external time code directly

- 1 Feed the external time code from an external time code generator (or another VTR) to the TIME CODE IN connector.

- 2 Set the switches on the SY-64 board as follows.



To record the VITC



To record the VITC generated from the internal time code generator, set the VITC switch on the SY-64 board to ON.

When the VITC switch is set to OFF, the VITC, if it is inserted in the input video signal (VITC indicator is lit), will be recorded.

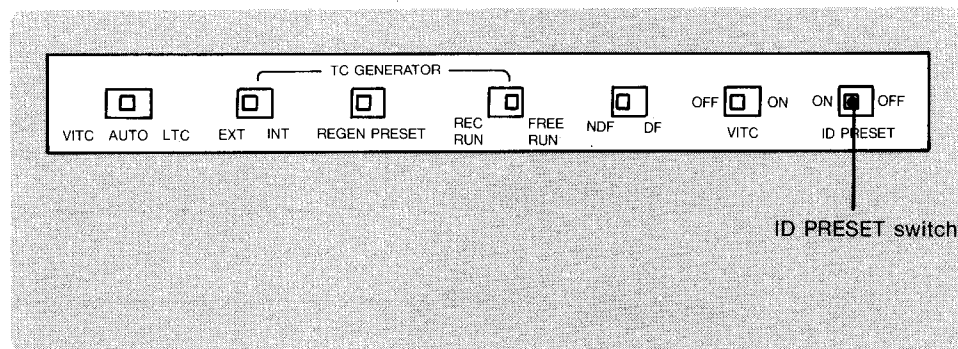
Note

When the VITC switch is set to ON, select the number of lines to insert the VITC in the SET UP menu 2. For details, refer to the maintenance manual.

Recording the ID code

A user bit data can be stored in non-volatile memory and can be recalled at any time afterward to record the data as an ID code.

To record the memorized ID code, set the ID PRESET switch on the SY-64 board to ON.



When the ID PRESET switch is set to OFF, the user bit set on the control panel will be recorded.

To memorize an ID code

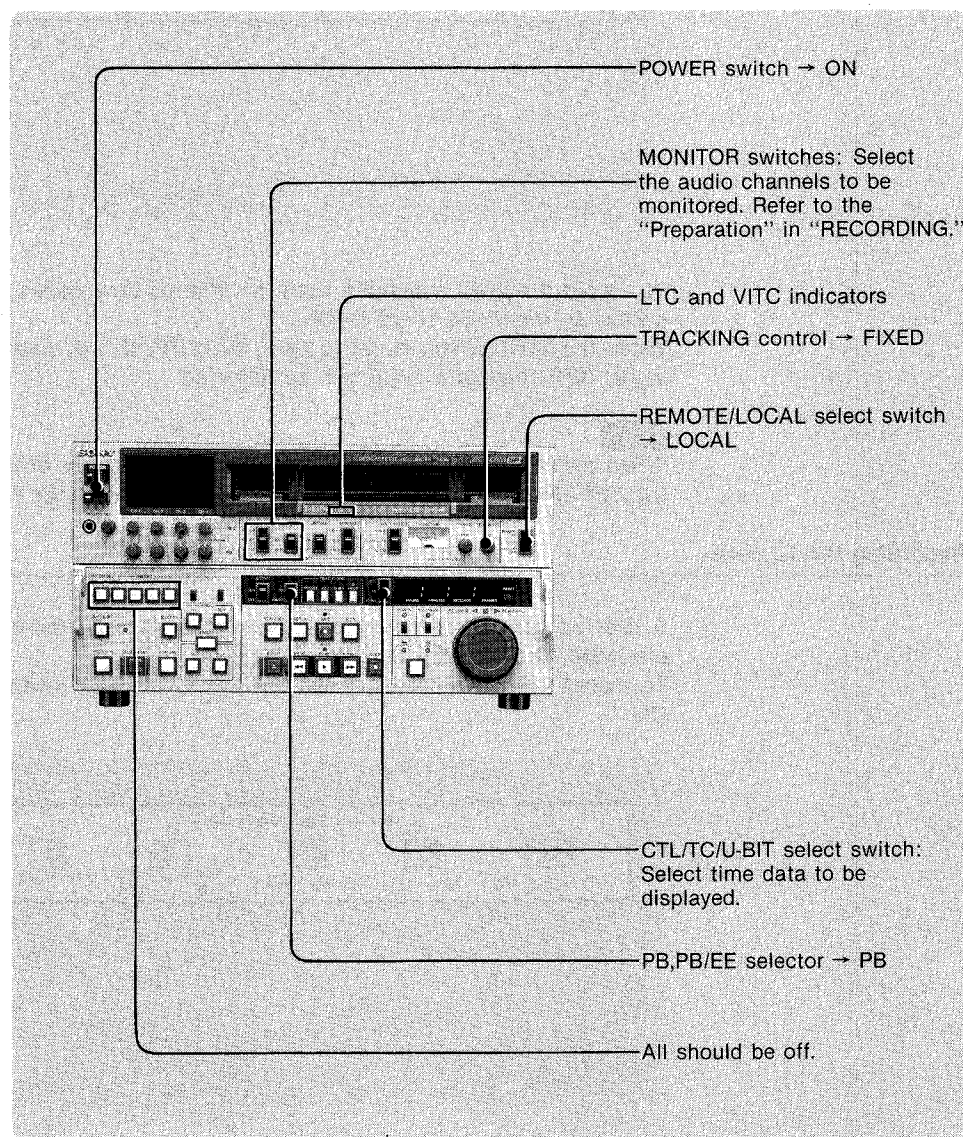
To memorize an ID code, refer to the maintenance manual.

PLAYBACK

Preparation

Setting check

Check the following settings before operation.



Selecting the time data

Select the time data to be displayed on the time counter display with the CTL/TC/U-BIT select switch.

To select the CTL

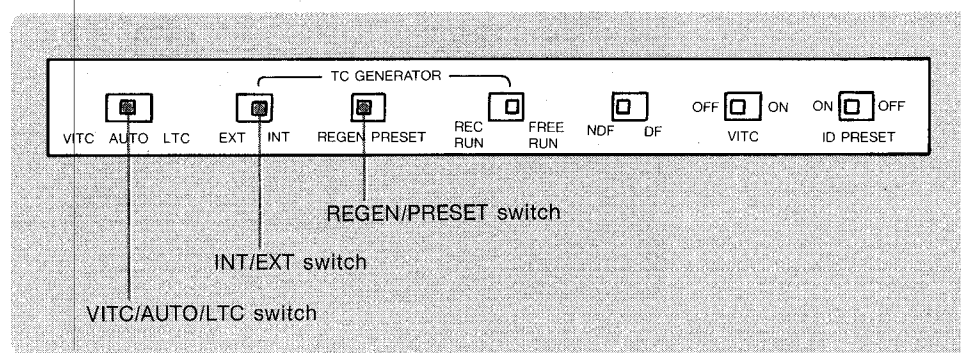
Set the CTL/TC/U-BIT select switch to CTL. When the CTL is selected, the time data is displayed by counting the CTL signal recorded on the tape.

The data can be reset to "0:00:00:00" by pressing the RESET button. When the tape is rewound from the "0:00:00:00" position, the data is indicated with the "-" (minus) mark at the beginning of the data*.

To select the TC

Set the CTL/TC/U-BIT select switch to TC. The playback time code is displayed by reading the recorded LTC or VITC.

Select the LTC or VITC with the VITC/AUTO/LTC switch on the SY-64 board inside the front panel.



VITC: VITC is read.

AUTO: The VITC is read when the playback speed is set in the range from $-1/2$ to $+1/2$ time normal speed. At other speeds, LTC is read.

LTC: LTC is read.

Time code indication

The LTC or VITC indicator lights when the LTC or VITC is found on the tape being played back.

Selecting the time code output

To supply the playback time code to other VTRs, it is recommended to regenerate the playback time code by the internal time code generator to avoid deterioration of the time code signal. Set the REGEN/PRESET switch to REGEN and INT/EXT switch to INT on the SY-64 board to output the regenerated time code from the TIME CODE OUT connector.

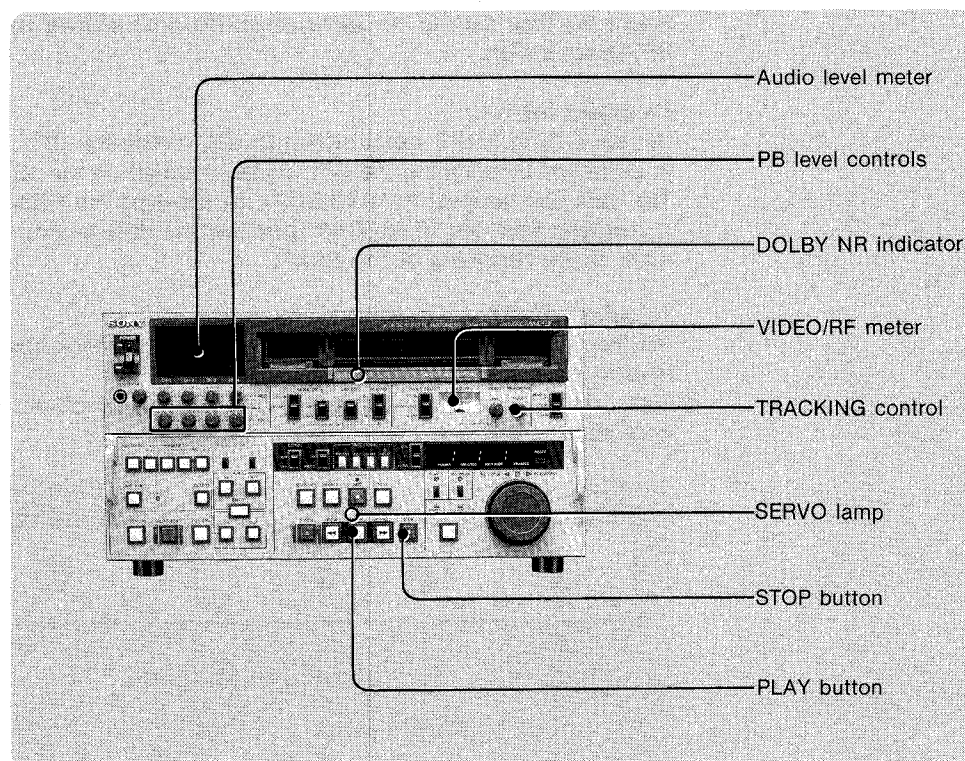
When REGEN/PRESET switch is set to PRESET, the playback time code is directly output.

To select the user bit

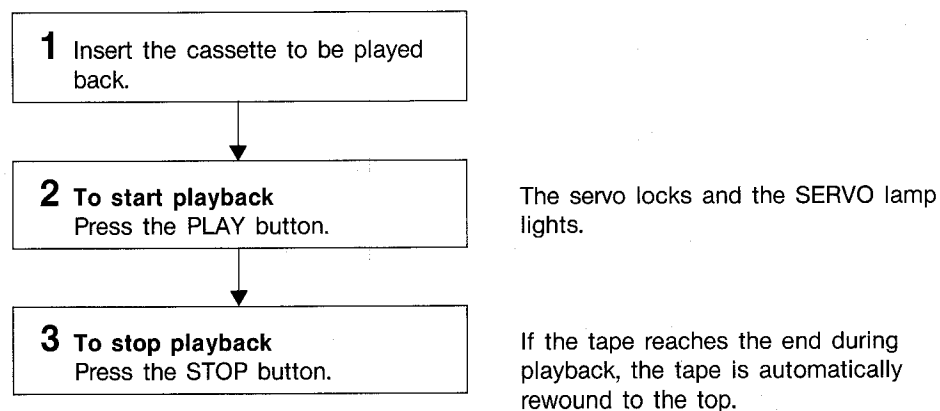
Set the CTL/TC/U-BIT select switch to U-BIT. The user bit in VITC or LTC is displayed depending on the VITC/AUTO/LTC switch on the SY-64 board.

*When the item number 007 (TAPE TIMER DISPLAY) in SET UP menu 1 is set to 24 H, the minus mark does not appear.

Operation (Normal PLAY mode)



Playback operation



Adjustment

To adjust the tracking

Normally, set the TRACKING control to FIXED.

If noise appears on the playback picture, turn the TRACKING control so that the VIDEO/RF meter indicates maximum RF level.

To adjust the audio playback level

(A) Setting to the preset level

Push in the PB level controls. Audio signal is output from the AUDIO OUTPUT connectors at the preset level*.

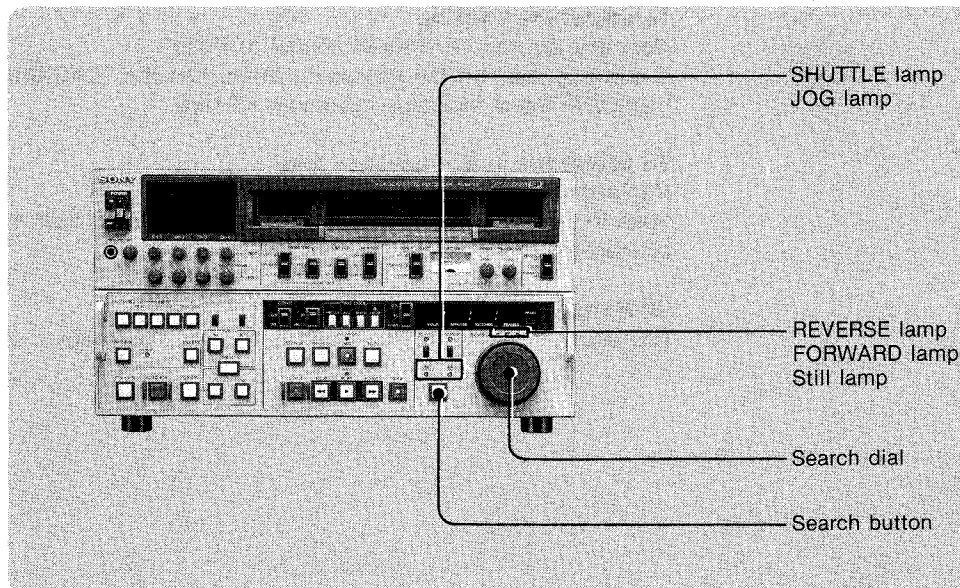
(B) Manual adjustment

Pull out the PB level controls and turn them clockwise or counterclockwise.

*The preset level can be changed.

To change the level, refer to the maintenance manual.

JOG or SHUTTLE Mode



Playback speed can be adjusted in the JOG or SHUTTLE mode as follows.

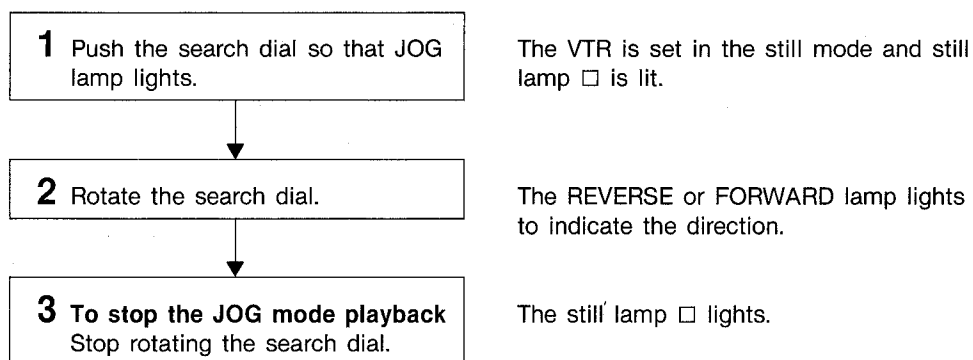
JOG/SHUTTLE mode can be selected with the search dial.

JOG mode (JOG lamp lights.): -1 to +1 time normal speed.

SHUTTLE mode (SHUTTLE lamp lights.): -24 to +24 times normal speed.

JOG mode playback

The playback speed changes according to the speed in which the search dial is rotated. When the dial is stopped, the tape speed is set to 0 and the VTR is set in the STILL mode.

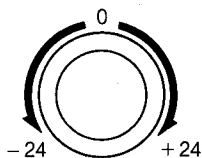


SHUTTLE mode playback

- 1** Select the SHUTTLE mode by pushing the search dial so that the SHUTTLE lamp is lit.

When still lamp ☐ is lit, the unit is set in the STILL mode.

- 2 To start the SHUTTLE mode playback**
Rotate the search dial to obtain the desired speed and direction.
 - The dial clicks at the center and both ends of the rotation.



The SHUTTLE mode playback starts at the speed determined by the position of the dial.

- 3 To stop the SHUTTLE mode playback**
Return the search dial to the center position or press the STOP button or another function button.
To set the unit in the normal PLAY mode
Press the PLAY button.

Note

When the SHUTTLE mode is selected right after the unit is turned on, the unit cannot detect the center position of the search dial (direction lamps \triangleleft ☐ \triangleright are off.) In this case, before starting the SHUTTLE mode playback, rotate the search dial so that the still lamp ☐ lights.

To repeat SHUTTLE mode and normal PLAY mode (or STOP mode)

After setting the desired speed in the SHUTTLE mode, press the PLAY button or STOP button to start normal playback or to stop the tape, then, to start the SHUTTLE mode playback again, press the search button.

To start the JOG or SHUTTLE mode playback by pressing the search button

Change the setting in SET UP menu 2, if necessary, so that the SHUTTLE mode or JOG mode playback will not start even if the search dial is rotated unless the search button is pressed.

For details, refer to the maintenance manual.

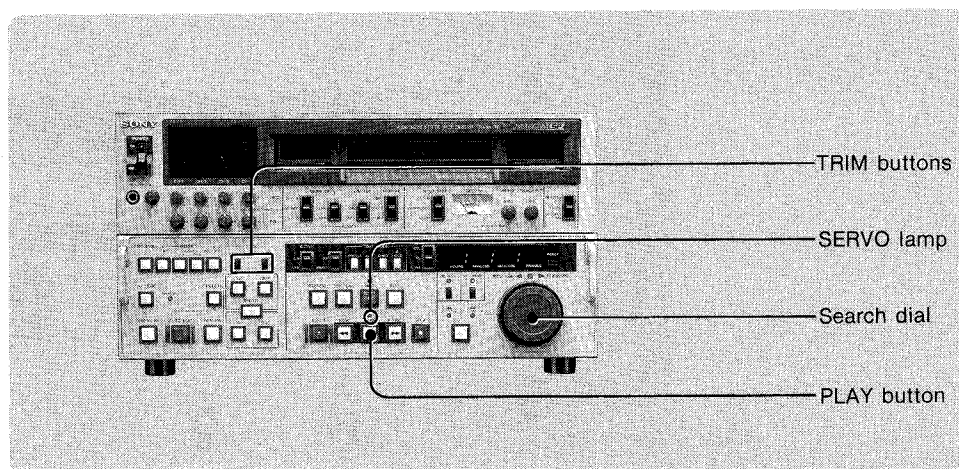
Capstan Override Mode

The Capstan Override mode is used to adjust the playback speed of this unit for synchronization with the other VTR in the parallel operation.

Two methods are available which differ in the adjustable range:

- (A) Adjusting the speed with the search dial. Adjustable range is $\pm 16\%$ of the normal speed.
- (B) Adjusting the speed with the TRIM buttons.
The speed is adjusted to $\pm 8\%$ of the normal speed only while the button is pressed.

Operation



1 Keep the PLAY button depressed.

2 (A) Using the search dial
Rotate the search dial clockwise or counterclockwise. Playback speed is adjusted according to the search dial position (in SHUTTLE mode) or according to the rotation speed (in JOG mode).
To return to the normal speed, set the dial to the center position or stop the rotation.

(B) Using the TRIM buttons
Keep the TRIM + or - button depressed. To return to the normal speed, release the TRIM button.

To cancel the Capstan Override mode
Release the PLAY button.

While the tape is running at the adjusted speed, the capstan servo is not locked and the SERVO lamp goes off.

The normal speed playback starts and the SERVO lamp lights.

Note

To adjust the speed with the search dial, change the setting in the SET UP menu 2 so that the unit will not start the SHUTTLE or JOG mode playback unless the search button is pressed. For details, refer to the maintenance manual.

AUTOMATIC EDITING I (Basic)

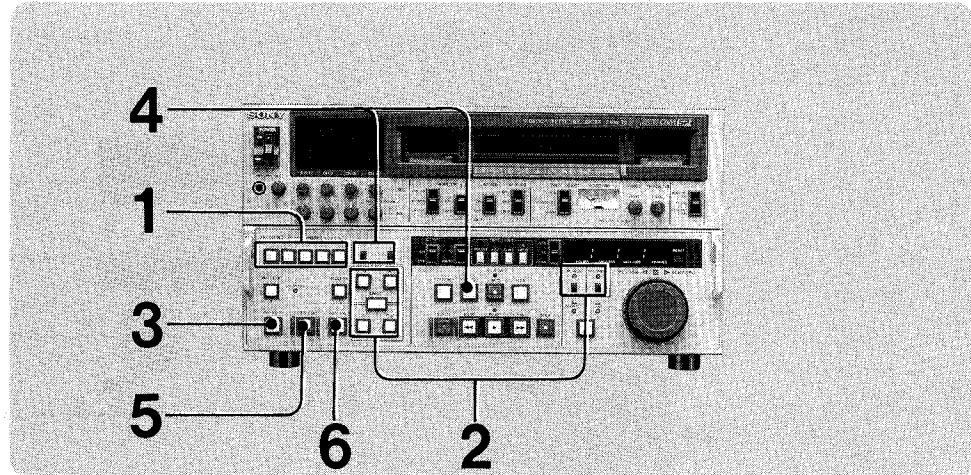
With the BVW-70, automatic editing can be performed in the following modes.

- ASSEMBLE mode→DMC (dynamic motion control) editing
- INSERT mode→Split editing, DMC editing

Before Editing

Operation for automatic editing

Automatic editing using the recorder and player is performed as follows.



1 Select the edit mode.

2 Enter the edit points for the player and recorder.

3 Preview the edit data.

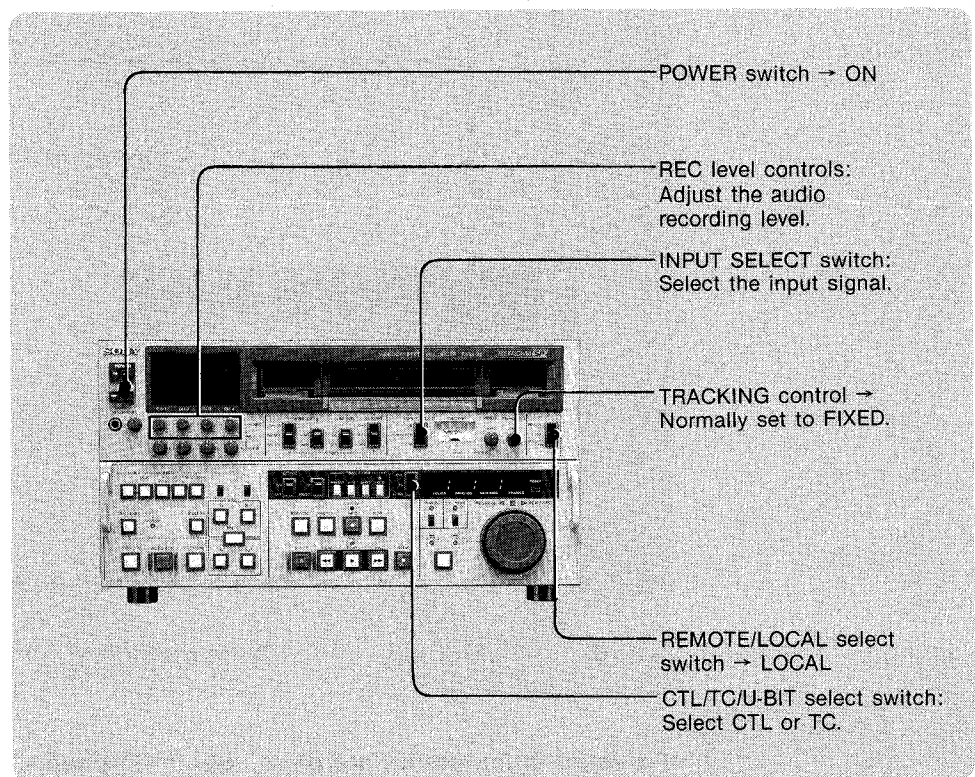
4 Check the edit point data and modify the data, if necessary.

5 Execute the editing.

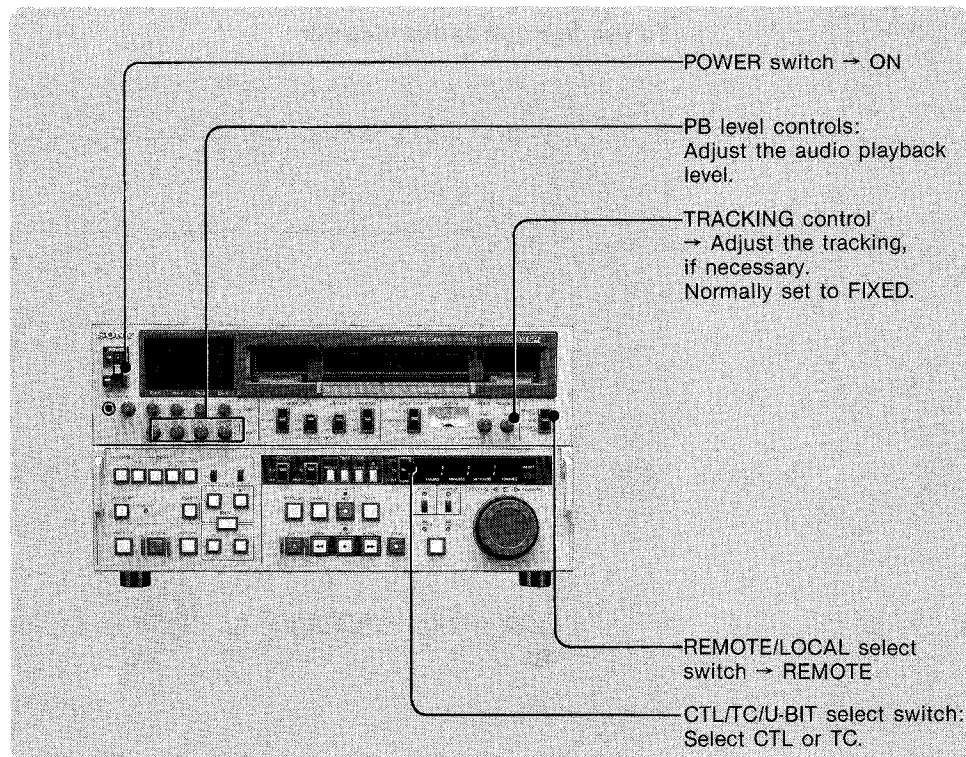
6 Review the editing.

Switch setting and adjustment

To use this unit as the recorder



To use this unit as the player



For details of the recorder and player, refer to "Preparation" in "RECORDING" and "PLAYBACK".

Time code interpolation with the CTL signal

To set the edit points with the time code, the time code must be recorded on the tape correctly in sequential order. Even if the tape is lacking in the time code in the middle, the CTL counter complements the data during the period, as long as the time code is recorded in the sequential order.

Time code recording during editing

During automatic editing, regardless of the INT/EXT switch and REGEN/PRESET switch on the SY-64 board, the internal time code generator is slave-locked to the reader and the data is recorded.

To use a U-matic VTR as a player

To record the video signal played back by a U-matic VTR, it is required that the signal be recorded in the framing mode. If the signal was not recorded in the framing mode, feed the signal to the recorder through a time base corrector. Otherwise, the video signal output from the VIDEO OUTPUT connectors of this unit may have vertical jitters.

To use an editing control unit

When this unit is controlled with an editing control unit, set the editing control unit so that the CUT-IN and CUT-OUT command is output 3 frames prior to the editing point.

To use BVE-500/500A

- The setting above cannot be made on the BVE-500/500A. To use these control units, set the EDIT DELAY in SET UP menu 2. For details, refer to the maintenance manual.
- To use an editing control unit such as BVE-500/500A, which uses a RECORD command in place of the ASSEMBLE command, declare the start of editing by pressing the ASSEMBLE button on this unit (recorder), after the controller and the unit are turned on, in order to change the drum rotation to the phase for recording. To return the unit to the condition in which the normal playback is possible (drum phase is advanced), turn off both the ASSEMBLE and INSERT buttons on the unit or set the REC INHIBIT switch to ON.

Video output signal on the monitor

When an edit mode is selected, the drum phase changes to the phase for recording (16-H advance stops), and V-blanking appears on either the PB or E-to-E video signal on the monitor. To prevent the V-blanking from appearing on the monitor, change the V-blanking position. If the position is changed, however, note that V-sync phase is different from that of the reference signal.

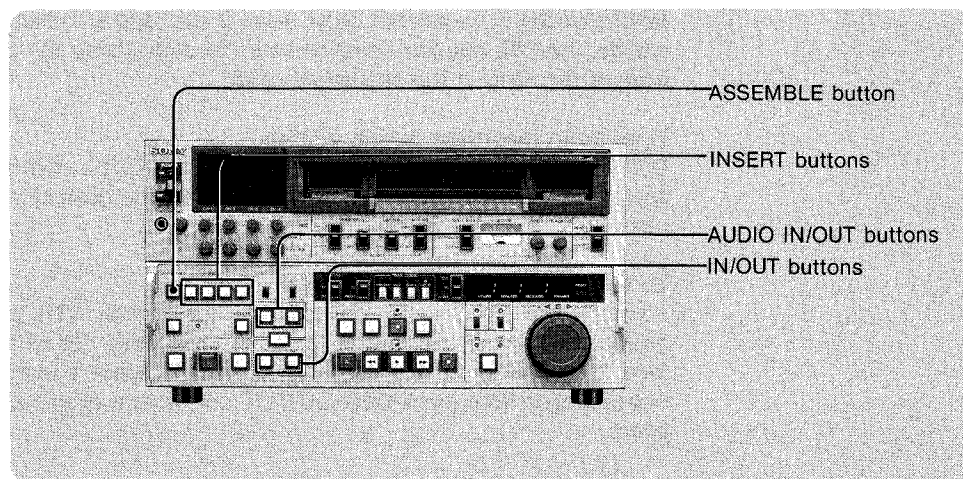
To change the V-blanking position, refer to the maintenance manual.

To use another BVW-70 connected to the DUB/COMPONENT 1 connector as a ON-AIR VTR

To send out the output playback signal to the next stage from another BVW-70 connected to this unit with an dubbing cable, keep the power of this unit turned on and set the INPUT SELECT switch of this unit to COMPOSITE or Y-R,B. When the switch is set to CTDM, the drum-advance OFF command is sent to the player and the V-blanking of the playback signal is shifted by 16 H.

Edit Mode Selection

Select the ASSEMBLE or INSERT mode as follows.



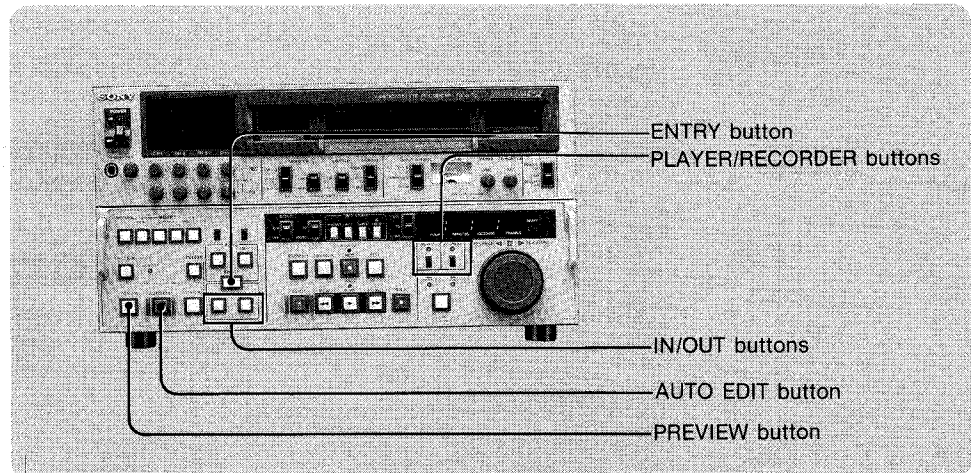
To select the ASSEMBLE mode
Press the ASSEMBLE button.

To select the INSERT mode
Press desired INSERT buttons.

When the edit mode is selected, the IN and OUT buttons start blinking to indicate that the edit point must be set.

Edit Points Setting

To set the edit points



1 Select the recorder or player by pressing the RECORDER or PLAYER button.

2 Search for the edit point in the JOG or SHUTTLE mode.

3 At the desired point, press the ENTRY button and either the blinking IN or OUT button simultaneously to set the IN or OUT point.

When the data is set, the IN or OUT button stays lit.

4 Set the necessary edit points for the recorder and the player by repeating the steps 1 to 3.

After both the recorder and player IN points have been set, the PREVIEW and AUTO EDIT buttons start blinking to indicate that preview and editing can be started.

If the IN point is not set

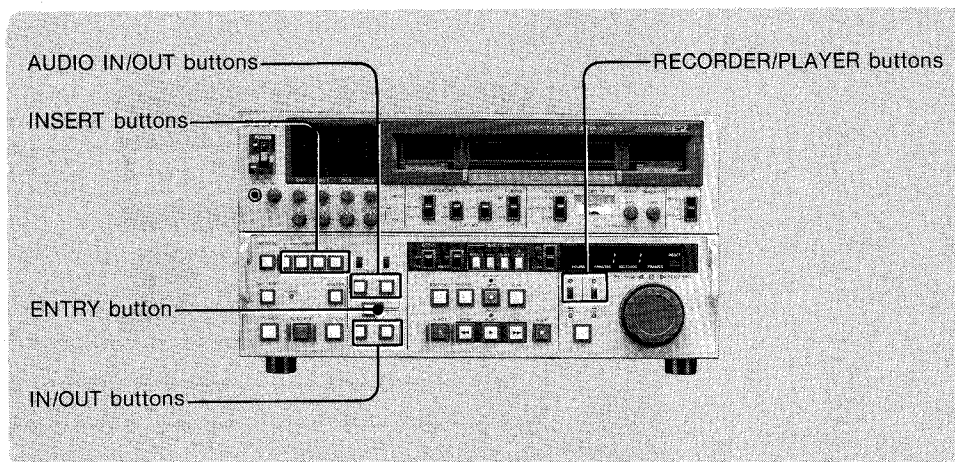
If preview or automatic editing is started when the IN point is not set or cannot be calculated, the present tape position is entered as the IN point automatically.

Automatic data calculation

To start editing, it is required to set three edit points out of four edit points. The remaining edit point is automatically determined with the other three points, and the button of the point goes off.

Setting the Edit Points for Split Editing

In split editing, LNG audio and video edit points can be set separately. Split editing is possible only in the INSERT mode.



1 Select the channels to be edited by pressing the INSERT buttons.

The IN and OUT buttons start blinking.

2 Select the recorder or player by pressing the RECORDER or PLAYER button.

3 Search for the edit point in the JOG or SHUTTLE mode.

4 At the desired point, press the ENTRY button and one of the IN, OUT, AUDIO IN or AUDIO OUT buttons simultaneously to set the point.

When the data is set, the IN, OUT, AUDIO IN or AUDIO OUT button stays lit.

5 Set the necessary edit points for the recorder and the player by repeating the steps 1 to 4.

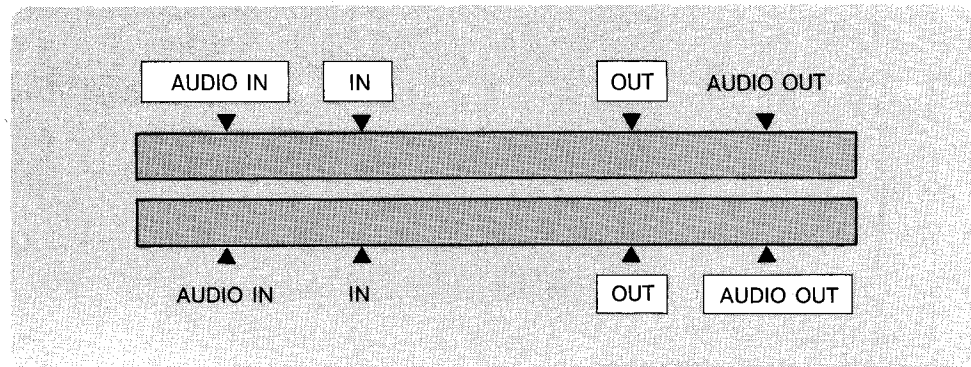
When a point is determined by calculation of the set data, the button of the point goes off.

Automatic data calculation

For split editing, set an audio IN, audio OUT, video IN, and video OUT points on either the recorder or the player VTR. Then, set one more video or audio edit point, and the other points are automatically determined with calculation of the set data.

Example

The set data is indicated in . The other data is calculated with the set data.



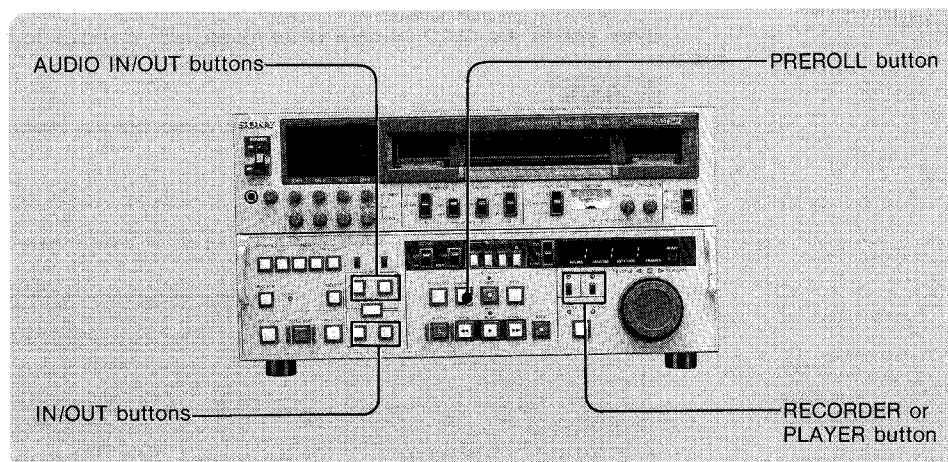
If the audio IN point is not set

If preview or split editing is started without setting the audio IN points while the audio OUT points are entered, the present tape addresses are automatically entered as the audio IN points and preview or split editing is performed.

If the audio IN/OUT points cannot be set on the player

On conventional "Betacam" VTRs or U-matic VTRs, edit points cannot be set for audio and video separately. To use the "Betacam" VTRs or U-matic VTRs as a player for split editing, set the audio IN/OUT points on the BVW-70.

Checking the Edit Points



To check the entered edit points

The entered edit points can be recalled on the time counter display.

- 1 Press the RECORDER or PLAYER button to select the VTR.

- 2 Keep one of the IN, OUT, AUDIO IN or AUDIO OUT buttons depressed.

The edit point data is displayed while the button is depressed.

To display the duration

The duration between the following two edit points is displayed on the time counter display.

- IN — OUT
- IN — AUDIO OUT
- IN — AUDIO IN
- OUT — AUDIO OUT
- OUT — AUDIO IN
- AUDIO IN — AUDIO OUT

1 Press the RECORDER or PLAYER button to select the VTR.

2 Keep any two of the IN, OUT, AUDIO IN and AUDIO OUT buttons depressed to indicate the duration between the points.

If the result of the calculation is negative, the “-” (minus mark) appears.

The duration is calculated as follows.

When both the points have been determined: The duration between the two points

When one of the two data is determined and the other is not: The duration between the determined data and the present tape address

When both the points are not determined: The duration between the two edit points used for the last editing.

To cue up an edit point or to perform preroll

Preroll to the edit start point* or cueing up a desired edit point is possible.

1 Press the RECORDER or PLAYER button to select the VTR.

2 To cue up an edit point
Press the PREROLL button and one of the IN, OUT, AUDIO IN or AUDIO OUT buttons simultaneously. The point is cued up and the tape is stopped.

To perform preroll
Press the PREROLL button. The tape runs 5 seconds before the edit start point and stops.

To change the preroll time

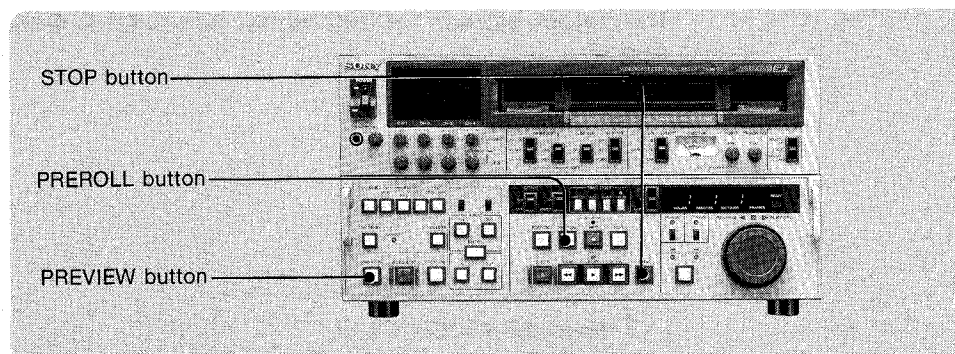
The preroll time is factory preset to 5 seconds and it can be changed from 0 to 15 seconds in one second steps. To change the time, refer to “SET UP”.

Note that the recording period prior to the edit start point should be long enough to permit the unit to perform preroll.

The preroll time in recorder-player editing corresponds to the setting on the recorder.

* In the split edit mode, preroll is performed to either the IN or the AUDIO IN point whichever is earlier.

Preview



After setting the edit point data, PREVIEW button starts blinking to indicate that preview can be started.

Press the PREVIEW button to start the preview.

- After preview, modify the edit data or re-enter the data, if necessary, and preview the data again.

Monitoring during preview

During preview, the following audio and video signals from the recorder and player can be monitored on the monitors connected to the recorder.

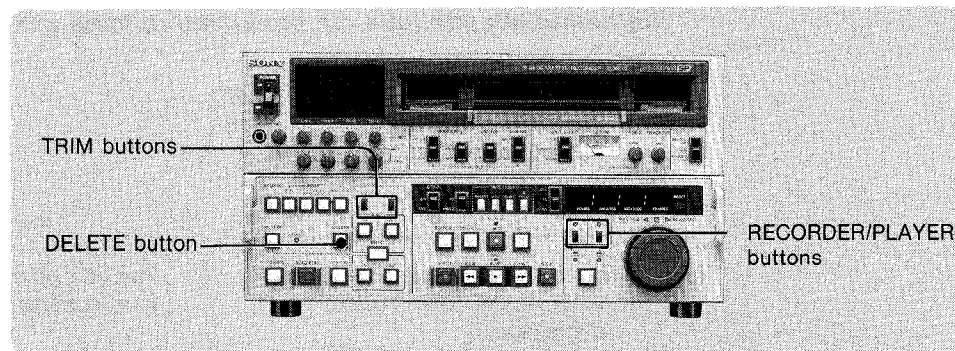
IN point		OUT point
▼		▼
PB (Recorder)	EE (Player)	PB (Recorder)

- During preview, the R/P head is used on the recorder VTR regardless of the CONF1 switch setting.

To stop preview

Press the STOP button. Then, to return the tape to the preroll point, press the PREROLL button.

To Modify the Edit Points



To delete the entered edit point data

If the DELETE button blinks after the edit points are set

The DELETE button blinks to indicate that preview or editing cannot be started since the edit points are set incorrectly, such as when the OUT point data is smaller than the IN point data or when the durations on the recorder and player are different. Set the data correctly or delete the incorrect data so that the DELETE button stops blinking*.

1 Press the RECORDER or PLAYER button to select the VTR.

2 Press the DELETE button and the IN, OUT, AUDIO IN or AUDIO OUT button simultaneously to delete the data.

DELETE button stops blinking.

3 If the IN, OUT, AUDIO IN or AUDIO OUT button goes off
The point does not have to be set.

The point is automatically determined by calculating the other point data.

If the IN, OUT, AUDIO IN or AUDIO OUT button starts blinking
The deleted edit point needs to be set again.

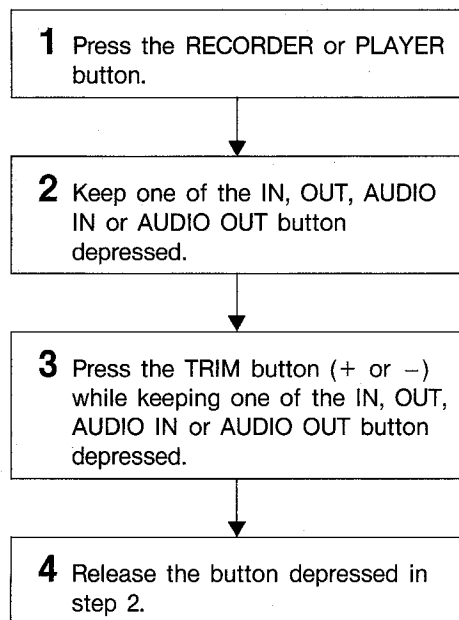
To stop the DELETE button blinking

Press the DELETE button by itself. The DELETE button stops blinking, but the incorrect edit point data is not deleted.

*Edit points can be deleted with the DELETE button at any time even if the DELETE button is not blinking.

To modify the data

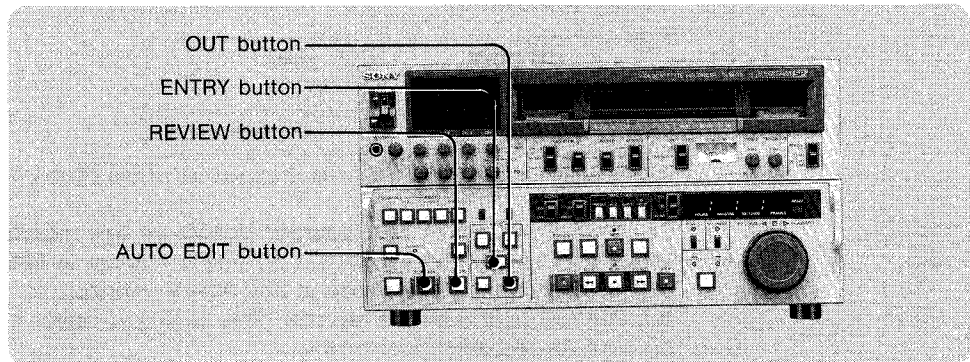
The entered edit point data can be modified by frame with the TRIM buttons.



The edit point data is displayed on the time counter display.

Every time the TRIM button is pressed, the data increases or decreases by one frame.

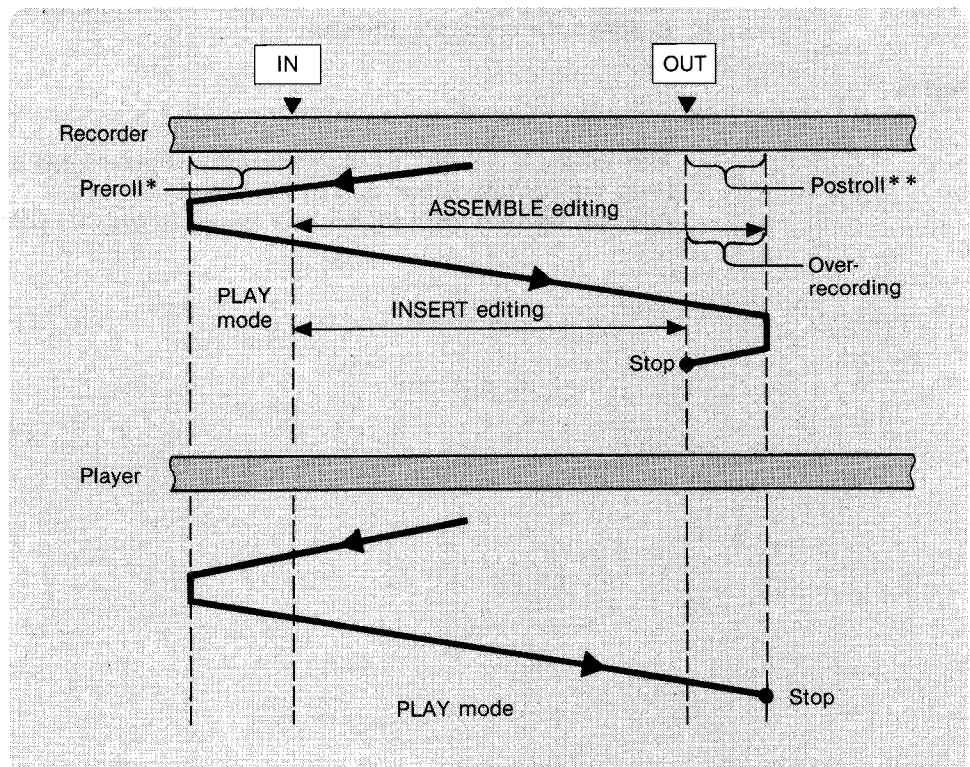
Executing Editing



To execute the editing

After setting the edit data, the AUTO EDIT button starts blinking to indicate that automatic editing can be started.
Press the AUTO EDIT button to start editing.

Tape running during editing



*Preroll time is factory preset to 5 seconds and can be changed in the SET UP menu 1.

** Postroll time is 2 seconds.

Monitoring during editing

During editing, the following audio and video signals from the recorder and player can be monitored on the monitors connected to the recorder.

IN point ▼		OUT point ▼
PB (Recorder)	EE (Player)	PB (Recorder)

- During editing, the R/P head is used regardless of the CONF1 switch setting.

To monitor the player and recorder signals on one monitor

When the item number 008 in SET UP menu 1 is set to data 1, it is possible to set the recorder in the E-to-E mode at any time to monitor the player signal by pressing the PLAYER button on the recorder. This setting is useful when only one monitor can be used for recorder-player editing.

To stop editing

To stop editing, press the ENTRY button and the OUT button simultaneously. The current tape address is set as the OUT point and editing is finished.

Note

To edit in the INSERT mode, use a tape on which the CTL signal has already been recorded. If CTL signals are missed on the tape on the recorder, the signal from the player is not recorded on that portion. Should this happen, the playback signal from recorder appears on the monitor instead of the E-to-E signal from the player, in order to attract the operator's attention.

Review

After editing is finished, the edited sound and picture can be monitored.

Press the REVIEW button to start the review.

After the review is finished, the tape returns to the OUT point and stops.

AUTOMATIC EDITING II (Advanced)

DMC (Dynamic Motion Control) Editing

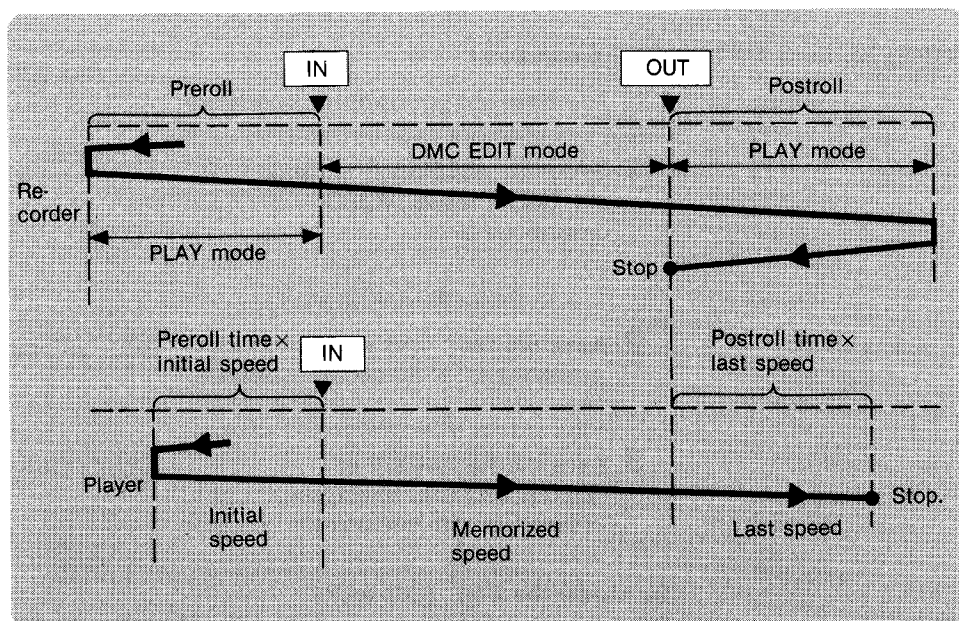
When a player has the DT function, player's tape speed (-1 to $+2$ times normal speed) can be controlled by the BVW-70 and be memorized before editing, and when editing is started, the memorized speed can be reproduced. This is called DMC editing.

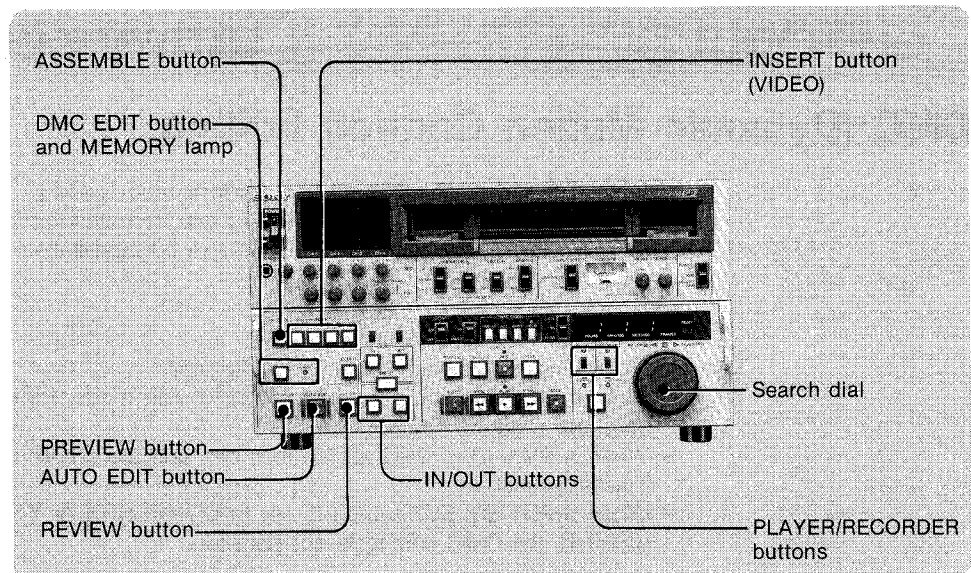
Conditions for DMC editing

DMC editing is possible in the following cases.

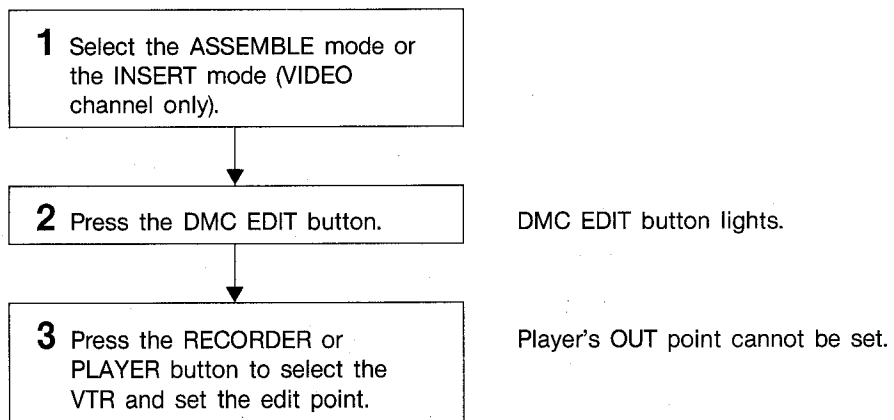
- Both in the ASSEMBLE or in the INSERT edit mode. However, DMC editing in the split edit mode is not possible.
- When a BVW-70 is used as the recorder, and the player VTR has the Dynamic Tracking function
- When INPUT SELECT switch is set to COMPOSITE or Y-R,B. When CTDM is selected, the DMC editing is not possible.

Tape running when the DMC editing is executed





Setting the DMC EDIT mode and edit point



To cancel the DMC EDIT mode

Press the DMC EDIT button and the DELETE button simultaneously.

Initial speed setting

The player's initial speed is determined with the search dial position. To set the desired initial speed, proceed as follows.

- 1** Keep the DMC EDIT button depressed.

The time counter display indicates the speed while the DMC EDIT button is depressed.



- 2 To set a speed**
Rotate the search dial and set the desired speed in the SHUTTLE mode.

To set the normal speed
Press the PLAY button.

Display	Speed
PLAY	Normal speed
Search 0:00	STILL
Search 0:03	FWD x 0.03
Search 0:10	FWD x 0.1
Search 0:20	FWD x 0.2
Search 0:50	FWD x 0.5
Search 1:00	FWD x 1
Search 2:00	FWD x 2
Search-0:03	REV x 0.03
Search-0:10	REV x 0.1
Search-0:20	REV x 0.2
Search-0:50	REV x 0.5
Search-1:00	REV x 1

- 3 When setting is finished**
Release the DMC EDIT button.

To set the initial speed in SET UP menu 2

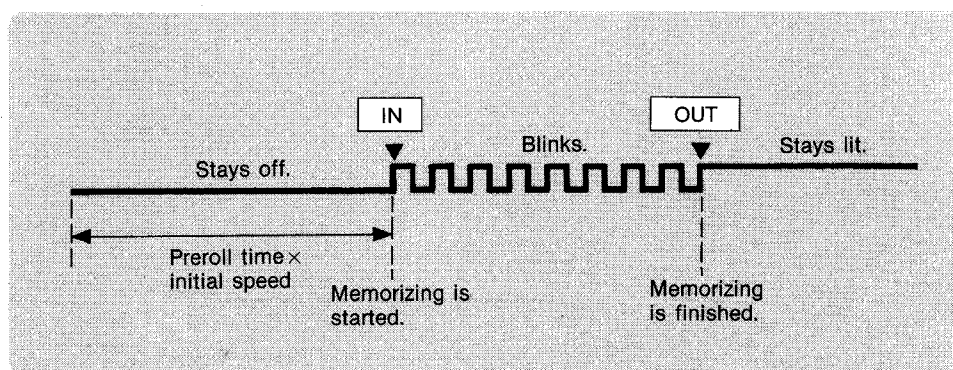
To use the same initial speed always in DMC editing, set the speed in SET UP menu 2. The initial speed set in the menu is used if no other speed is set in the operation above.

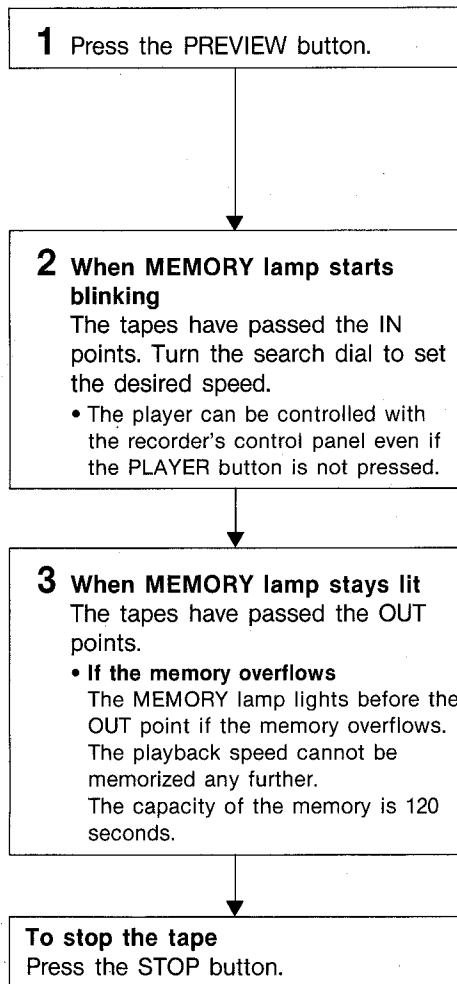
To set the initial speed in SET UP menu 2, refer to the maintenance manual.

Memorizing the playback speed

Player's tape speed is memorized during preview. To change the speed, turn the search dial.

MEMORY lamp indication during preview





Tapes start running from the preroll point.
Player's tape starts running at the initial speed and recorder's tape runs at the normal speed.

The player's tape speed is memorized while the **MEMORY** lamp is blinking.

Memorizing is finished.

To preview the editing

Press the **PREVIEW** button again to start preview.
During preview, playback speed can be changed with the search dial again.

Executing the DMC editing

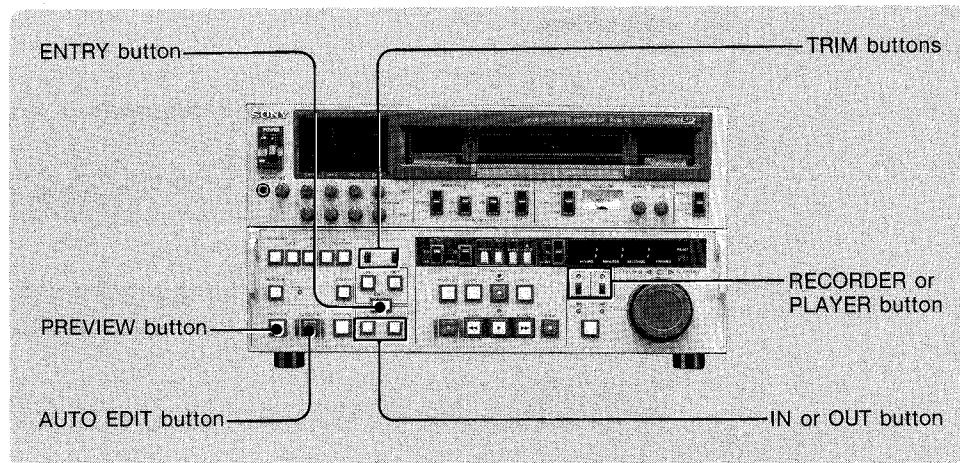
Press the **AUTO EDIT** button after preview is completed. The player's tape runs at the memorized speed during editing.
The memory of the playback speed is erased after editing is completed.

Review of the editing

Press the **REVIEW** button after editing is completed.

Quick Editing

After an edit mode is set, preview and setting the edit points can be done simultaneously to save time as follows.



1 Press the RECORDER or PLAYER button to select the VTR, and stop the tape of each VTR at the desired point.

2 Press the PREVIEW button.

The present tape addresses designated in step 1 are set as the IN points, and preview is started. IN buttons of the recorder and player light.

3 To set the OUT point
Press the OUT and ENTRY buttons simultaneously at the desired point.

The OUT points are set and the recorder and the player will stop after 2 seconds.

4 Preview again, if necessary, and modify the edit with the TRIM buttons.

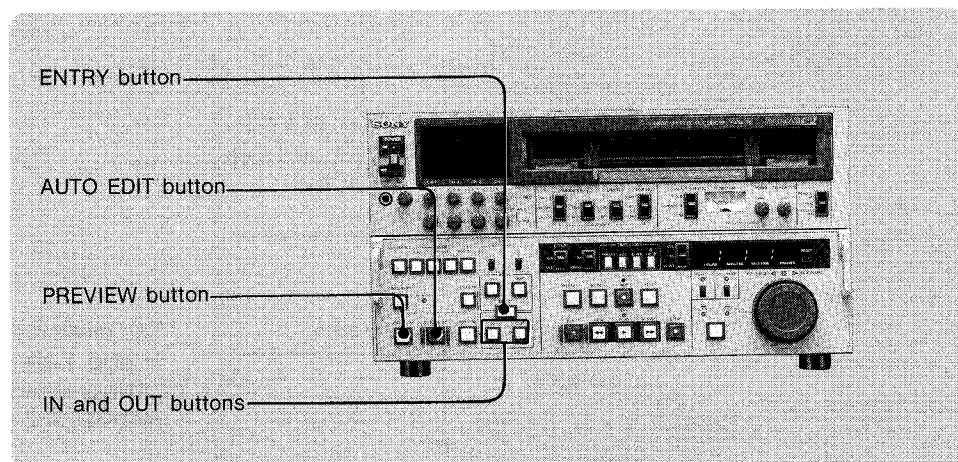
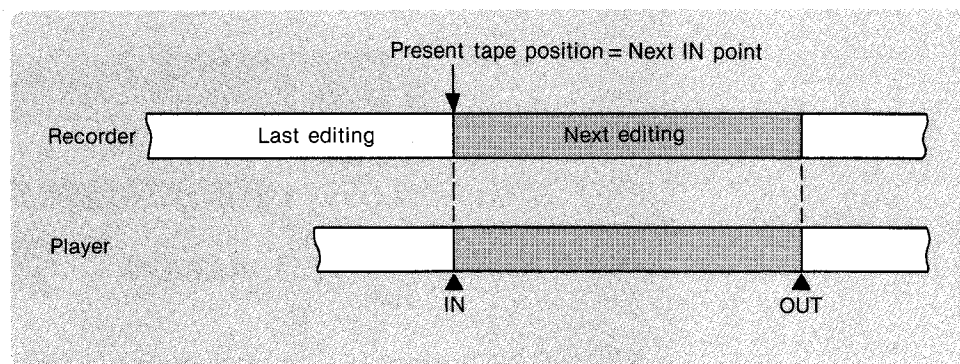
5 To start editing, press the AUTO EDIT button.

For more quick editing

- (1) Omitting steps 2 to 4, start editing by pressing the AUTO EDIT button after step 1. The present tape points are set as the IN points and editing is started.
- (2) To stop editing, press the OUT button and ENTRY button simultaneously.

Continuous Editing (Butt Edit)

After automatic editing is completed, continuous editing is possible by entering IN and OUT points on the player and pressing PREVIEW or AUTO EDIT button. In this operation, last OUT point of the recorder is automatically used as the IN point for the next editing.



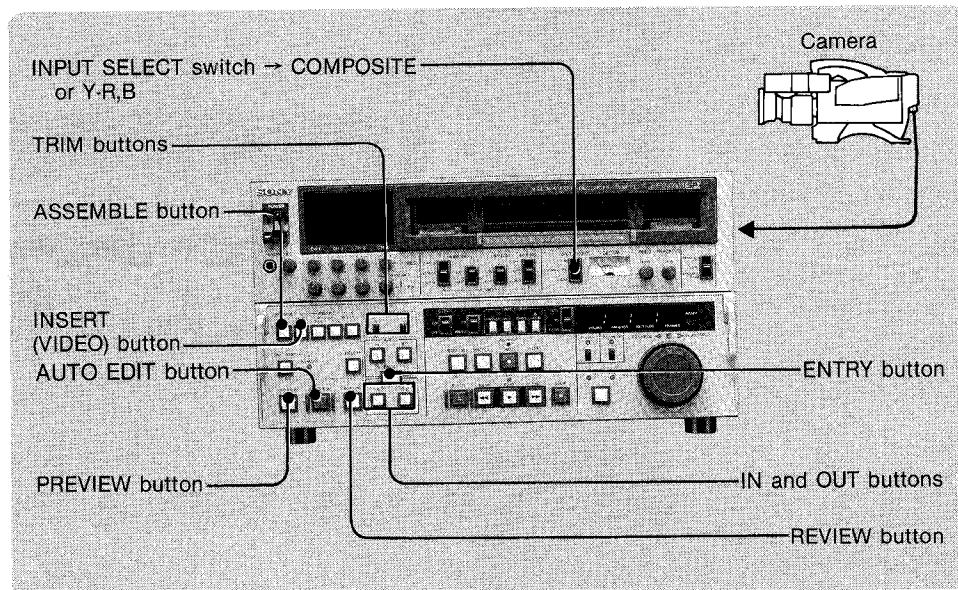
- 1 Set the IN and OUT points of the player.
- 2 Press the PREVIEW button to start preview.
- 3 Press the AUTO EDIT button to start editing

When editing is finished, the recorder's tape stops at the OUT point and the player's tape stops at the postroll point (2 seconds after the OUT point).

To stop editing

Press the ENTRY button and the OUT button simultaneously.

Camera Picture Editing



1 Select the ASSEMBLE mode or INSERT mode.

2 Set the edit points. For ASSEMBLE editing, set the IN point, and for INSERT editing, IN and OUT points.

3 Preview the data by pressing the PREVIEW button and, if necessary, modify the data with the TRIM buttons.

4 To start editing, press the AUTO EDIT button.

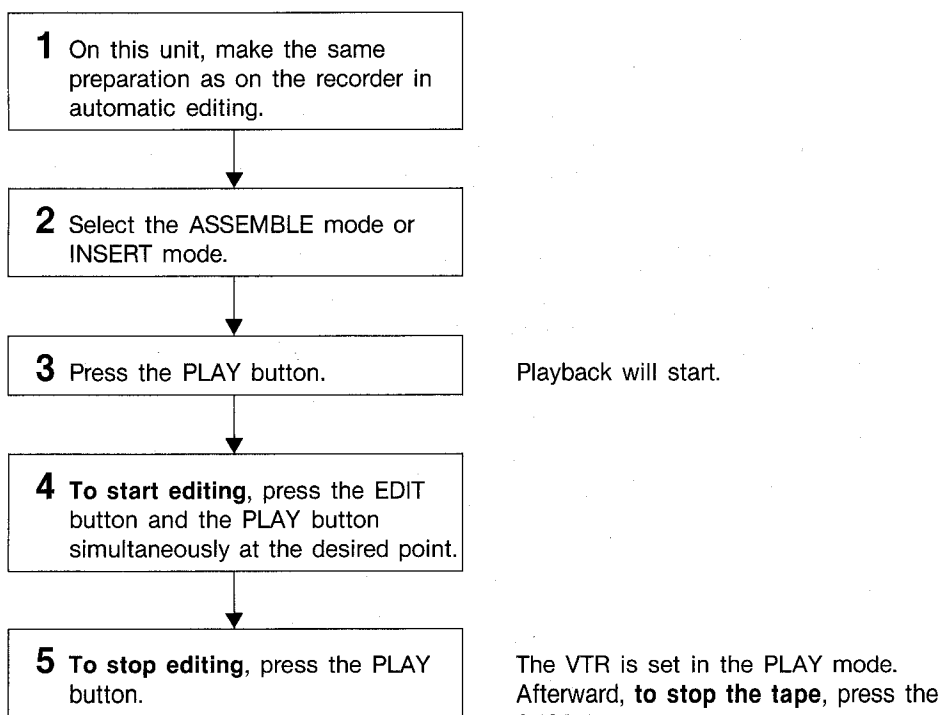
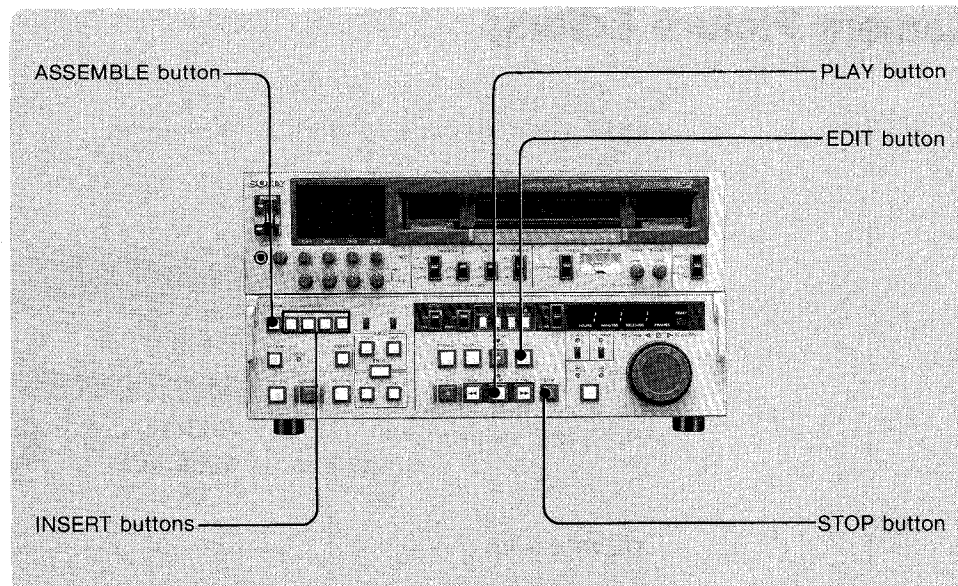
INSERT editing will be finished at OUT point and the tape will stop.

To stop editing

To stop editing, press the ENTRY button and the OUT button simultaneously.

To review the editing, press the REVIEW button.

MANUAL EDITING



Notes

- Do not start editing in the STOP mode or do not stop editing with the STOP button directly, or else the picture may be distorted at the point.
- To allow the picture to become stable, set the VTR in the PLAY mode for more than 2 seconds before starting editing.

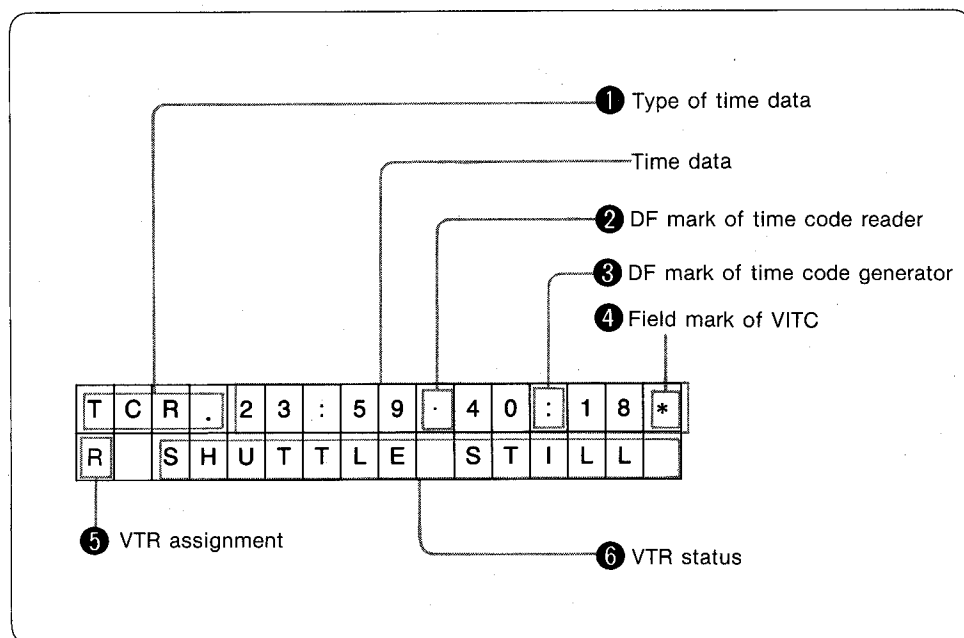
SUPERIMPOSED CHARACTERS

When the CHARACTER switch on the SY-61 board is set to ON, characters to show the time data and operation mode of VTR are superimposed on the signal output from the VIDEO OUT 3 and MONITOR connectors.

Control of characters

Position and size of the superimposed characters can be changed in SET UP menu 1. For details refer to the "SET UP" section in this manual.
Display mode (either positive or negative characters) can be selected with an internal circuit board. For details, refer to the maintenance manual.

Display of superimposed characters



1 Type of time data

CTL: Data of the CTL counter
TCR: Time code data of the LTC (longitudinal time code) reader
UBR: User bit data of the LTC reader
TCR.: Time code data of the VITC (vertical interval time code) reader
UBR.: User bit data of the VITC reader
TCG: Time code data of the time code generator
UBG: User bit data of the time code generator
IN: Time data of IN point
OUT: Time data of OUT point
AI: Time data of AUDIO IN point
AO: Time data of AUDIO OUT point
DUR: Duration of any two out of 4 edit points (IN, OUT, AUDIO IN and AUDIO OUT)

Note

When the time data or user bits cannot be read correctly, "*" mark is displayed here like "T*R", "U*R", "T*R.", "U*R.".

2 DF mark of time code reader

3 DF mark of time code generator

· Drop frame mode
: Non drop frame mode

4 Field mark of VITC

Blank: Field 1, 3

*: Field 2, 4

5 VTR assignment

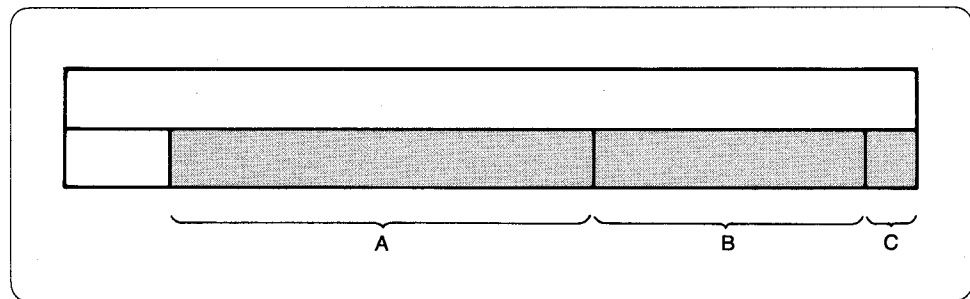
VTR character assignment is displayed only when a player VTR is connected to the unit. Otherwise no indication appears.

R: The control panel controls the recorder VTR (this unit).

P: The control panel controls the player VTR.

6 VTR status

This part is divided into three blocks, A, B and C. Block A indicates the operation mode, and block B the servp lock condition or tape speed. Block C shows ■ mark when the VTR is in edit interval.



Display		Operation mode
A	B	
TAPE UNTHREAD		After a cassette is ejected, this message is displayed until another cassette is inserted.
STANDBY OFF		Standby off mode
T. RELEASE		Tape tension is released.
STOP		Stop mode
F. FWD		Fast forward mode
REW		Rewind mode
PAUSE		Pause mode
PREROLL		Preroll mode
PLAY		Play mode (Servo is not locked.)
PLAY	LOCK	Play mode (Servo is locked.)
PLAY	+ TSO - TSO	Playback speed is controlled in capstan override mode.
REC		Record mode (Servo is not locked.)
REC	LOCK	Record mode (Servo is locked.)
EDIT		Edit mode (Servo is not locked.)
EDIT	LOCK	Edit mode (Servo is locked.)
JOG	STILL	A still picture in jog mode
JOG	FWD	Jog mode in the forward direction
JOG	REV	Jog mode in the reverse direction
SHUTTLE	(speed)	Shuttle mode and its tape speed
VAR	(speed)	Variable mode and its tape speed
D-PREV	(speed)*	DMC preview mode
D-EDIT	(speed)*	DMC editing mode
DMC-SPD	(speed)	Initial speed setting for DMC
PREVIEW		Preview mode
AUTO EDIT		Automatic editing mode
REVIEW		Review mode

* Initial speed or memorized speed

NOTES

Head Cleaning

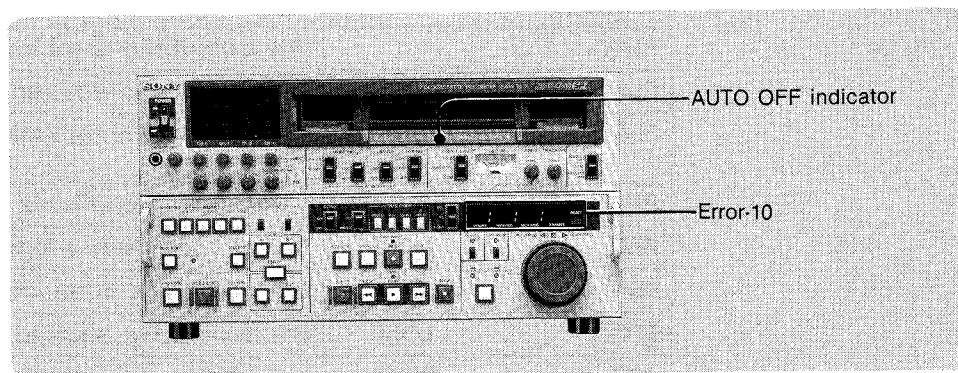
Clean the video and the audio heads with the optional BCT-5CLN video head cleaning cassette. For the usage, refer to the instructions of the cassette.

Note

Be sure to eject the cleaning cassette after use to avoid the damage to the heads.

Moisture Condensation

If moisture condensation is detected on the head drum during operation, the AUTO OFF indicator on the front panel will light.



If the AUTO OFF indicator lights, the drum and the capstan motors stop and the cassette will be ejected. Then, the drum will begin rotating again. The indicator will go off when the condensation is removed.

When the VTR is moved directly from a cold to a warm location

Before turning on the VTR, wait for about 10 minutes to allow the moisture, if any, to condense. Then, turn on the unit.

(A) If the AUTO OFF indicator is lit

Wait until the indicator goes off. The cassette cannot be inserted while the indicator is lit.

(B) If the indicator is not lit

The unit can be used.

SPECIFICATIONS

General

Power requirements	90 V to 265 V AC, 48 to 64 Hz
Power consumption	Serial No. 10001 ~ 10682: 225 W 10683 and higher: 240 W
Operating temperature	5°C to 40°C (–41°F to +104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Humidity	Less than 80 %
Weight	30 kg (66 lb 3 oz)
Dimensions	427 × 237 × 520 mm (w/h/d) (16 ³ / ₄ × 9 ³ / ₈ × 20 ¹ / ₂ inches)
Tape speed	118.6 mm/s
Maximum record/playback time	More than 90 minutes with a BCT-90ML cassette
Fast forward/rewind time	Less than 180 seconds with a BCT-90ML cassette
Search speed	SHUTTLE: STILL, 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 24 times normal in forward and reverse directions JOG: STILL to 1 time normal in forward and reverse directions
Recommended tapes	1/2-inch cassette for "Betacam" or "Betacam SP" VTR Metal particle tape: BCT-5M/10M/ 20M/30M/60ML/90ML Oxide tape: BCT-5K/10K/20K/30K/60L/90L and equivalent

Video

Video recording system

Luminance	FM
Chrominance	FM (Compressed Time Division Multiplex)

Characteristics		Metal particle tape	Oxide tape
Bandwidth	Luminance	30 Hz to 4.5 MHz +0.5dB –3.0dB	30 Hz to 4.1 MHz +0.5dB –6.0dB
	Chrominance	R-Y: 30Hz to 1.5 MHz +0.5 dB –3.0 dB B-Y: 30Hz to 1.5 MHz +0.5 dB –3.0 dB	
Signal-to-noise ratio	Luminance	More than 51 dB	More than 48 dB
	Chrominance	AM: More than 53 dB PM: More than 53 dB	More than 50 dB More than 50 dB
K-factor (2T pulse)		Less than 2%	Less than 3%
DG		Less than 2%	Less than 3%
DP		Less than 2°	Less than 3°
Y/C delay		Less than 20 ns	

Audio

Recording format

CH-1/2

CH-3/4

Bias recording

FM recording

Characteristics		Metal particle tape	Oxide tape
Channels		CH-1/2 (LNG audio) and CH-3/4 (AFM audio)	CH-1/2 (LNG audio)
Frequency response	CH-1/2	50Hz-15kHz +1.0dB -2.0dB	50Hz-15kHz±3dB
	CH-3/4	20Hz-20kHz +0.5dB -2.0dB	
Dynamic range	CH-3/4	More than 85 dB	
Signal-to-noise ratio (at 3% distortion level)	CH-1/2	More than 72 dB	More than 50 dB (DOLBY NR OFF)
Distortion (THD) (at reference level, 1 kHz)	CH-1/2	Less than 1%	Less than 2%
	CH-3/4	Less than 0.5%	
Crosstalk (at reference level, 1 kHz)	CH-1/2	Less than -65 dB	
	CH-3/4	Less than -70 dB	
Phase difference	CH-1/2	±20° (15kHz)	
	CH-3/4	±10° (20kHz)	
Wow & flutter	CH-1/2	Less than 0.1% rms	

Processor adjustment range

Video level	±3 dB
Chroma level	±3 dB
Set-up level	±15 IRE
Hue	±15°
System SC phase	360°p-p
System sync phase	+3 -1 μs (fine adjustment range 300ns)
Y/C delay	±50 ns

Input connector

Video input	
REF VIDEO	BNC (2 for bridging connection) Black burst or 1.0 Vp-p ± 0.3 V, 75 ohms, sync negative (286 mV)
VIDEO INPUT	BNC (2 for bridging connection) Composite video, 1.0 Vp-p, 75 ohms, sync negative
DUB/COMPONENT 1	12-pin multi (Male)
Luminance	1.0 Vp-p, 75 ohms, sync negative
Chrominance	R-Y: 0.7 Vp-p, 75 ohms B-Y: 0.7 Vp-p, 75 ohms
COMPONENT 2	BNC (3)
Luminance	1.0 Vp-p, 75 ohms, sync negative
Chrominance	R-Y: 0.7 Vp-p, 75 ohms B-Y: 0.7 Vp-p, 75 ohms
Audio input	
CH-1/2/3/4	XLR 3-pin (Female, 4) LOW: -60 dBm, 600 ohms/3 kohms selectable, balanced HIGH: +4 dBm, 600 ohms/10 kohms selectable, balanced
TIME CODE IN	XLR 3-pin (Female) 0.5 to 18 Vp-p, 10 kohms, balanced

Output connectors

Video output	
REF VIDEO	BNC Black burst, 75 ohms, sync negative (286 mV)
VIDEO OUTPUT 1/2/3	BNC (3) Composite video, 1.0 Vp-p, 75 ohms, sync negative By setting the internal board switch, non-composite video (0.714 Vp-p, 75 ohms) can be output from the VIDEO OUTPUT 2 connector, and time code and other information can be superimposed on the signal output from the VIDEO OUTPUT 3 connector.
DUB/COMPONENT 1	12-pin multi (Female)
Luminance	1.0 Vp-p, 75 ohms, sync negative
Chrominance	R-Y: 0.7 Vp-p, 75 ohms B-Y: 0.7 Vp-p, 75 ohms
COMPONENT 2	BNC (3)
Luminance	1.0 Vp-p, 75 ohms, sync negative
Chrominance	R-Y: 0.7 Vp-p, 75 ohms B-Y: 0.7 Vp-p, 75 ohms
Audio output	
CH-1/2/3/4	XLR 3-pin (Male, 4) +4 dBm, (at 600 ohms load), low impedance, balanced
SELECTED	XLR 3-pin (Male, 2) +4 dBm, (at 600 ohms load), low impedance, balanced

• Input/output video signal level is measured at 100/7.5/77/7.5 color bars.

MONITOR

8-pin multi (Female)

Video: 1.0 Vp-p, 75 ohms, sync negative

By setting of the internal board switch, time code
and other information can be superimposed on the
signal output from the MONITOR connector.

TIME CODE OUT

Audio: -5 dBs, 47 kohms, unbalanced

XLR 3-pin (Male)

2.2 Vp-p, 600 ohms, balanced

HEADPHONES

JM-60 stereo phone jack

Maximum -14dBs, 8 ohms

Remote connectors

TBC REMOTE

15-pin multi (Male)

REMOTE 1-IN

9-pin multi (Female)

REMOTE 1-OUT

9-pin multi (Female)

REMOTE 2

36-pin multi (Female)

Others**Accessories supplied**

AC power cord (1)

RCC-5G 9-pin remote control cable (1)

12-pin dubbing cable (1)

Extension board A (1)

Extension board B (1)

Extension board C (1)

PSW 4x16 screws for rack mounting (4)

Operation manual (1)

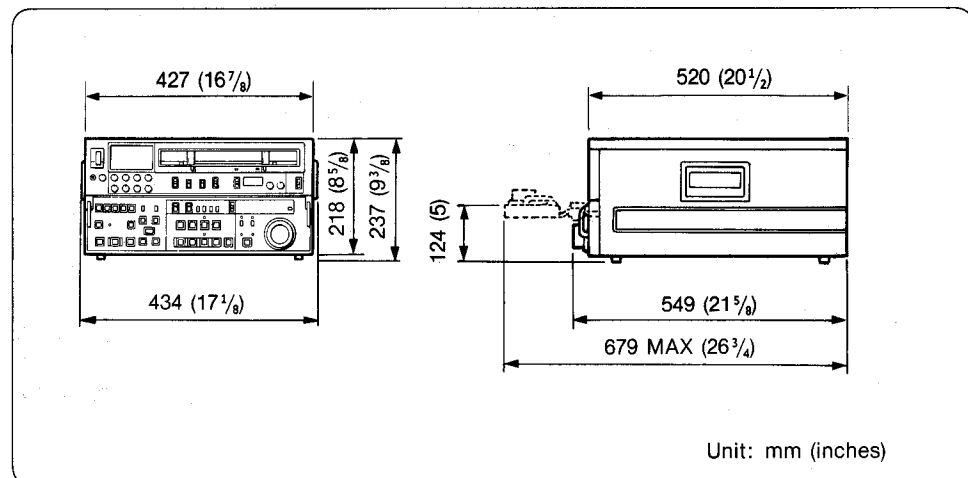
Maintenance manual (1)

Optional accessories

Rack mount adaptor RMM-100

Cleaning cassette BCT-5CLN

Control panel BVR-75

Dimensions

Design and specifications subject to change without notice.

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